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REPORT

of the

Board of State Engineers

of the

State of Louisiana

to

His Excellency, Jared Y. Sanders,

Governor of Louisiana

from

April 20, 1910 to April 20, 1912.

The L. Graham Co., Ltd.
New Orleans, La.
1912

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8. The Caddo Levee District, by Act 74 of 1892.
9. The Bossier Levee District, by Act 89 of 1892.
10. The Buras Levee District, by Act 18 of 1894.
11. The Cat Island Levee District, by Act 110 of 1894.
12. The Grand Prairie Levee District, by Act 24 of 1898.
13. The Plaquemines Parish East Bank Levee District, by Act 7 of 1902.
14. The Red River and Bayou des Glaizes Levee and Drainage District, by Act 107 of 1904.
15. The Saline Levee and Drainage District, by Act 80 of 1906.
16. The North Bossier Levee District, by Act 138 of 1906.
17. The Orleans Levee District. In the case of this District, created by Act 93 of 1890, the only reference to the Board of State Engineers is as follows:

"Section C. Be it enacted, etc., That the said Board of Levee Commissioners, as to location, construction and repairs of all levees necessary to protect said district, shall first have the approval in writing of the Board of State Engineers."

Later on, by Acts 79 of 1892, and 140 of 1900, the Board of Commissioners of the Orleans Levee District was required to have the approval in writing of the Board of State Engineers, as to location, construction and repairs of levees "on the river front of said District," only.

In addition to the foregoing, a number of general laws are in force, specially calling for, or imposing other duties upon, either the Board of State Engineers, as a whole, or the Chief State Engineer, as the head of the department.

In fact, with each recurring session of the General Assembly of the State, the field operations of the Board of State Engineers are materially enlarged, and the duties required of its members and its corps of employees greatly increased.

In addition to the general administration of the affairs of the department, as specified by law and passed into practice by precedent, the Board of State Engineers has, during this period, been called into service on a number of occasions in the matters of information, advice and direction by your Excellency, notably, in furtherance of the good roads movement; by the United States, many of the Police Juries of the State, drainage and reclamation districts, and other public

bodies, involving, in a number of instances, extended inspections, surveys and other engineering work.

In this way, the constant care and attention of the members of the Board of State Engineers has been necessary during the entire time covered by this report, and, in addition to the office force proper, has required the regular employment of a number of instrument men, and, from time to time, of an equal number of rodmen, as assistants in the field. On occasions, too, the employment of men in other capacities, both in the field and in the office, was demanded.

With direct reference to the members of the Board of State Engineers, themselves, their attention has, as heretofore, been directed to the affairs of all the levee districts, and to duties in any one of them, as occasion demanded. As a matter of system and convenience, however, the performance of the engineering work required in the levee districts generally, was, up to March 30th, 1911, assigned for special attention as follows, viz: In the Tensas Basin and Fifth Louisiana Levee Districts, to Assistant State Engineer Walter H. Hoffman; in the Atchafalaya Basin, Lafourche and Buras Levee Districts, to Assistant State Engineer H. C. Smith; in the Pontchartrain, Lake Borgne, Grand Prairie and Plaquemines Parish East Bank Levee Districts, to Assistant State Enigneer J. W. Monget; in the Caddo, North Bossier, Bossier, Red River, Atchafalaya and Bayou Boeuf, Red River and Bayou des Glaizes, and Saline Levee Districts, to Assistant State Engineer Gervais Lombard.

On March 30th, 1911, however, in order to comply with the requirements of Act No. 49 of 1910, known as the "Highway Law," Assistant State Engineer Gervais Lombard was, for economic and other reasons, selected, by resolution of the Board of State Engineers, to act as State Highway Engineer, pending the employment later on by the Board of State Engineers of a competent person to fill that position.

This required a re-distribution of territory to the other three members of the Board, resulting as follows, viz: The Tensas Basin, Fifth Louisiana, Caddo, North Bossier and Bossier Levee Districts to Assistant State Engineer Walter H. Hoffman; the Red River, Atchafalaya and Bayou Boeuf, Red River and Bayou des Glaizes, Saline and Atchafalaya Basin Levee

Districts to Assistant State Engineer H. C. Smith; the Pontchartrain, Lafourche Basin, Buras, Lake Borgne, Grand Prairie and Plaquemines Parish East Bank Levee Districts to Assistant State Engineer J. W. Monget.

The special engineering work required, during the period of this report, by the Orleans Levee District, the Joint Organization of the Atchafalaya Basin and Lafourche Levee Districts, the Board of Control of the New Basin Canal and Shell Road, and the Board of Control of the Louisiana State Penitentiary, together with attention to the general administration of affairs connected with public improvement in all parts of the State, and in the main office of the Department, devolved upon Chief State Engineer Frank M. Kerr.

Levee Work for the Past Two Years.

The contracts and agreements for levee work, undertaken during the past two years, by the State of Louisiana and the several levee districts of the State, with twenty-four contracts entered into previous to April 20th, 1910, and still in force at that date, numbered one hundred and forty-eight, involving the handling of 8,992,001 cubic yards of earthwork, estimated to cost $1,795,703.93.

The amount and cost of levee work actually performed under these contracts (not taking into consideration percentages retained until completion), between April 20th, 1910 and April 20th, 1912, by the State of Louisiana, and the Levee Districts of the State, with that done by the United States, is shown in the following table:

WORK DONE BY	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
The Levee Districts	28.73	46.06	5,199,876	$1,183,167.33
The State of Louisiana	26.38	45.01	2,892,125	612,536.60
The United States	11.47	36 29	3,205,090	636,514.15
Aggregates	66.58	127.36	11,297,091	$2,432,218.08

The foregoing, divided as to territory, is as follows:

LOCALITY	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
IN ARKANSAS				
On the Arkansas River	0.70		273,572	$ 92,905.54
On the Mississippi River	1.44	10.70	874,989	206,143.61
IN LOUISIANA				
On the Mississippi River	30.69	76.57	7,577,569	1,565,214.09
On the Red River	14.87	2.62	973,318	172,418.83
On the Atchafalaya River	5.71	7.80	996,274	286,155.81
On the Boeuf River	0.14		12,545	2,877.80
On the Gulf Coast	5.35	23.67	392,139	65,324.56
Interior Streams	7.68	6.00	196,685	41,177.84
Aggregates	66.58	127.36	11,297,091	$2,432,218.08

The amounts given in the foregoing tables do not include those involved in the drainage work executed by the Red River, Atchafalaya and Bayou Boeuf Levee District, during the past two years, costing $10,159.84. Nor do they include the work for the improvement of Bayou Lafourche, for navigation and the supply of fresh water, undertaken by the Joint Organization of the Atchafalaya Basin Levee District and the Lafourche Levee District, on which some $486,892.16 has been expended from inception to date.

In addition to the above, there still remains to be done, under contracts of the State and the several Levee Districts of the State, in force at this time, an amount of levee work estimated to aggregate not less than 2,030,054 cubic yards, and to cost (in addition to percentages retained until completion) not less than $365,513.84.

Again, a considerable amount of work has, as usual, also been done in, and expenditures incurred by the several levee

districts of the State and by the United States for weed cutting, minor repairs, wooden revetments and for auxiliary works of various descriptions, information upon which to base exact statements in regard to all these particulars is not, in every instance, at hand, but the sum involved was, as usual, considerable.

Details relative to the location, character, extent and cost of the levee work of the past two years will be found in the paragraphs of this Report appearing under the head of "The Levee Districts," and in tabular form in Appendix A.

The Levee System.

The principal lines of continuous levee at present protecting the alluvial lands of Louisiana against overflow are as follows:

(1) From the high lands near Pine Bluff, Ark., down the right bank of the Arkansas River, to within about five miles of the mouth of the old Arkansas River, a distance of about eighty-seven miles, extending through the Linwood-Auburn District of Jefferson County, the Linwood-Auburn Levee District of Lincoln County, the Red Fork Levee District, and that part of the Desha Levee District above Arkansas City, some seventy-one and four-tenths (71.4) miles of which is leveed continuously. At the lower end of this continuous line, an extension, some 2.6 miles in length, running along Dry Bayou towards the main line of levee constituting the head of the Mississippi River Levees has been constructed by the United States. This extension reduces the gap between the Mississippi and Arkansas River levee systems to about 3.5 miles.

(2) From Costello's Gin, a point on Amos Bayou, about five miles South of Red Fork and about twelve miles West of the mouth of the Arkansas, a continuous line of levee extends down the left bank of Amos Bayou about five miles; thence—crossing Boggy Bayou to the right bank of Cypress Bayou, about 1.5 miles; thence about six miles down the right bank of Cypress Bayou to Lucca Landing, on the Mississippi River, where it joins the levee system on the right bank of the Mississippi River; and thence continues down through Desha and Chicot Counties, Arkansas, to Panther Forest, 16 miles below Arkansas City, where a breach in the line of levee oc-

curred on April 12, 1912. Thence the line, at this date, is still continuous down through Chicot County, Arkansas and the Fifth Louisiana Levee District to Alsatia Plantation, about 17 miles below Lake Providence, in East Carroll Parish, Louisiana, where a breach occurred on the same day. Thus, with the exceptions stated, the line of levee from Costello's Gin, Arkansas, to Point Breeze, Louisiana, aggregates about 325.4 miles in length.

(3) From Torras Landing, at the mouth of Red River, (or, more properly, the mouth of Old River), the levee extends down the right bank of the Mississippi River, without break or interruption, to the outlet known as "The Jump"—that is, to within about 10 miles of the head of the Passes, a length of 285.7 miles.

And from the same point at Torras Landing, the levee line runs along the South bank of Old River 5.7 miles to Barbres Landing; and thence down the left bank of the Atchafalaya River, to a point about 9.7 miles below East Melville, where a breach in the line occurred on April 6, 1912. From this point to a point 2.1 miles below Bayou Alabama, the line is at this time, again still continuous, making an aggregate from Torras Landing to the present terminus below Bayou Alabama of 49.6 miles.

(4) On the left bank of the Mississippi River the levee line extends uninterruptedly from Baton Rouge to what is known as the Lucas Canal, about 6.0 miles below Fort St. Philip, a length of about 217.2 miles.

Up to 1909, the outlet through the left or East bank of the river, known as Baptiste Collette Gap, located about three miles below Fort St. Philip, remained open.

However, upon the strong representation of parties in interest, that the overflow through this gap or outlet was, even at normal stages of the river, causing serious and extended damage to considerable areas of land, and to certain important and valuable interests, particularly the oyster interests, this gap was finally closed in 1909, provision therefor having been made jointly by the State, the Grand Prarie Levee District, and what was at that time known as the Oyster Commission of Louisiana, since styled the Fish and Game Commission.

The line of levee thus built, including the dam proper across

the outlet, and the wings along the upper and lower side of the outlet, is 6,451 feet in length, or 1.2 miles, thus forming a detached local stretch of levee (in the Grand Prarie Levee District) of that length, in addition to the continuous line in the district of 30.4 miles.

(5) The upper levee system of the Caddo Levee District, on the right or West bank of Red River, extends from Blanton Bluff, Arkansas, about three-quarters of a mile above the Louisiana Line, to Twelve Mile Bayou, a length of line of about 51.4 miles.

(6) The lower levee system of the Caddo Levee District—also on the right or West bank of Red River—, extends from the Bluffs, on the North side of Bayou Pierre, to near the lower limits of Caddo Parish, a length of line of about 34.9 miles.

(7) The levees of the Bossier Levee District, on the left bank of Red River, extend from the highlands opposite Old Benton, Louisiana, to the old Dennison Plantation, a length of about 48 miles.

Below this, the natural banks of Red River, in Bossier Parish, are, except at Ninock and Swift Chute Bayous, generally high enough, as compared with the high water of the past, to restrain all but very extreme floods, occurring, in the light of history, at long intervals of time. Both of these streams are closed by levees.

(8) Along the South bank of Loggy Bayou, in the Parish of Red River, there has been constructed by the State, during the past year, an aggregate of 0.9 miles of levee, in the form of ten dikes, closing as many sloughs and depressions, formerly permitting escape from Loggy Bayou, in time of flood in Red River, and overflowing considerable territory below, much in advance of the bank full stages of Red River and Loggy Bayou, which are generally superior in elevation to most high waters in Red River.

(9) The upper system of the Red River, Atchafalaya and Bayou Boeuf Levee District, is continuous from a point on the South bank of Bayou Rapides, on the Cooper Place, about 7.6 miles above Alexandria, to its junction with Red River, at the latter point; thence down the right bank of Red River to the Avoyelles Prairies at David's or Moncla's Ferry, 35.3 miles in length, or a total for the upper system of 42.9 miles.

(10) The lower levee system of the Red River, Atchafalaya and Bayou Boeuf Levee District is continuous on the right bank of Bayou des Glaizes, from the "Junction," a point about 9.0 miles above Moreauville, down the Bayou to its junction with the Atchafalaya River, at Simmsport, about 48 miles; and thence down the right or West bank of the Atchafalaya River to a point near Atkins Bayou, about 4.5 miles below Melville, where a breach in the line of levee occurred on April 10, 1912. From this point to and across Bayou Bigraw, the line is, at this time, again still continuous for about 10 miles. The total mileage for the entire district is, at this time, therefore, about 130.7 miles.

(11) The levee system of the Red River and Bayou des Glaizes Levee and Drainage District, will, when completed, comprehend a length aggregating probably 125 miles, of which, however, only 27 miles have so far been constructed, extending from the Avoyelles Prairies at David's or Moncla's Ferry to a point about 1.5 miles below Natchitoches Bayou.

(12) The levee system contemplated for the Saline Levee and Drainage District aggregates about 17.5 miles in length. Of this, however, but 10.3 miles, extending from Cassandria to and across Coco Point, have so far been completed.

(13). The levee system of the Plaquemines Parish East Bank Levee District excludes the overflow waters of the Gulf of Mexico from that portion of the Parish of Plaquemines included in the Lake Borgne Basin and Grand Prairie Levee Districts, extending from the upper line of Harlem Plantation to the upper bank of Cusilich Canal, on the property of Peter Cusilich, below the site of the old quarantine station, a distance by the levee line of about 32.3 miles. In addition to this, there are cross levees at Harlem, Bohemia, Nestor Canal (both sides), Bayou Lamoque (both sides), and Cusilich Canal, agregating about four (4) miles.

The aggregate length of levee lines thus generally described is 1,302.6 miles. In addition to these, there are a number of lengths of levee lines in comparatively isolated localities, and on interior streams, some parts of which are not located in any regular levee district, aomunting to about 333.8 miles, making a total length of levee lines more or less protecting

Louisiana, at this time, of 1,636.4 miles; that is, 158.3 miles in the State of Arkansas and 1,478.1 miles in Louisiana, divided, according to territory and streams, as follows, viz:

REVISED LENGTHS OF LEVEE LINES IN LOUISIANA AND THAT PART OF ARKANSAS AIDING IN THE PROTECTION OF LOUISIANA.
APRIL 20, 1912.

	Miles on Mississippi River	Miles on Red River	Miles on Atchafalaya River	Miles on Bayou Lafourche	Miles on Other Streams	Total Miles By Districts
Tensas Basin					(a) 40.0	40.0
Fifth Louisiana	241.1				(b) 39.0	280.1
Atchafalaya Basin	127.2		43.9	(c) 75.0		246.1
Pontchartrain	125.5				(e) 0.3	125.8
Lafourche	117.0			(e) 74.1		191.1
Orleans	25.7				(f) 46.8	72.5
Lake Borgne Basin	48.0					48.0
Grand Prairie	31.6					31.6
Plaquemine Parish East Bank					(g) 36.3	36.3
Buras	33.6					33.6
Caddo		86.3			(h) 9.0	95.3
Bossier		48.0				48.0
Red River, Atchafalaya and Bayou Boeuf		35.3	39.8		(i) 55.6	130.7
Red River and Bayou des Glaizes		27.0				27.0
Saline		10.3				10.3
North Bossier (j)						
Cat Island	(k) 12.8					12.8
State of Arkansas, aiding in the protection of Louisiana	71.8				(l) 86.5	158.3
Outside of Levee Districts	(m) 13.1	(n) 35.9				49.0
Total by Streams	847.4	242.8	83.7	149.1	313.5	1,636.5

a. Includes 10.5 miles on Ouachita River, 17 miles on Black River, and 13 miles on Little River.
b. Includes 12.7 miles on Black River, and 26.3 miles on Tensas River.
c. and e. These systems, due to closure of bayou at head, pending construction of lock, in disuse at this time, also since closure of Bayou Lafourche, cut through in many places for easy access to bayou for connecting canals.
d. Includes 0.3 miles of cross levee at head of system.
f. Rear levees, etc.
g. Along Gulf Coast, Parish of Plaquemines, East Bank, includes 7 cross levees.

h. All on Bayou Pierre in disuse since closure of Tones Bayou.
i. Includes 7.6 miles on Bayou Rapides and 48 miles on Bayou des Glaizes.
j. System not yet begun.
k. Fragmentary, built before organization of district. Distrirt not in operation.
l. Includes 71.4 miles on Arkansas River, from Pine Bluff, Ark., to lower end of Arkansas River system, also 2.6 miles extension of Arkansas levee system towards Cypress Bayou, and 12.5 miles on Amos Bayou and Cypress Bayou above head of system on Mississippi River.
m. Around Angola State Farm.
n. Includes Loggy Bayou new levee 0.9 miles, Murrel new levee 0.4 miles, Westdale 0.9 miles, Grand Bend 0.6 miles, and 33.1 miles of fragmentary lengths of levee lines on Red River.

The Construction of Levees.

In the construction of levees in Louisiana, and that part of Arkansas affecting Louisiana, undertaken by the State and the levee districts of the State, the following general specifications, quoted from the "General Specifications and Conditions," usually maintain, viz:

"3rd. The contractor assumes all risks from subsidence in foundation, or base, accidents, floods and casualties of every kind which may occur before the completion and acceptance of the work, and shall sustain all damages and injury that may be caused thereby.

"4th. No part of the work herein contracted for shall be given, sold, or assigned to a sub-contractor without the consent of the President of this Board, expressed in writing; nor shall said contractor or his sureties be released from personal and immediate responsibility without like consent.

"5th. The embankment shall be built of such material, and disposed and distributed in such manner as the engineer in charge may direct, under the requirements of the Board of State Engineers. The required allowance for shrinkage shall be added to the height of the embankment; this allowance to be at the discreation of the engineer in charge, up to one-fifth in excess of the net height of the embankment; it being understood that a cubic yard of embankment under this agreement is a net cubic yard of settled earth, and equal to five-sixths of a cubic yard of material in place, within the limits prescribed.

"6th. The contractor shall remove all trees, stumps, logs, roots, stalks, weeds, grass, trash and perishable matter of every kind not specially exempted from this requirement by instructions from the engineer in charge, and plow or spade up the ground over the entire surface to be covered by the embankment. He shall grub up by the roots all trees and stumps within the limits of the base of the embankment, and three feet on either side of the base. He shall remove all buried logs, brick or walls and other material considered unsuitable by the engineer in charge. He shall refill all holes made by grubbing or by the removal of unsuitable materials, as aforesaid, with solid earth up to the level of the natural surface of the ground, and the refilling of such holes shall not be paid for by the cubic yard (except in special cases, when so directed by the engineer in charge), but shall be considered as a part of the clearing and grubbing to be done as incidental or auxiliary work, payment for which shall be included in the price per cubic yard of embankment hereinafter stipulated. He shall carefully clean all ditches crossing the line of embankment, and fill them with solid earth up to the level of the natural surface of the ground for a distance of twenty (20) feet from the base of the embankment on the land side, and for the width of the berme prescribed on the river side. He shall cut muck ditches of such depth and size as may be prescribed by the engineer in charge. If required by the engineer in charge, the clearing, grubbing, preparation of base and cutting of muck ditch, as above, shall be completed, and the muck ditch refilled throughout the whole length of the embankment, or any part thereof, before the embankment be begun. In the construction of the embankment he shall, except where other material may be ordered by the engineer in charge, use earth only, and shall place it in layers of such thickness as may be directed by the engineer in charge, and extending the full width of the embankment. Except when otherwise granted permission in writing by the engineer in charge, he shall obtain all earth from the river side of the embankment, leaving a berme of the natural surface of the ground.....feet wide between the base of the embankment and the borrow pits. Unless otherwise directed by the ngineer in charge, all borrow

pits shall be sloped on the side nearest the embankment not steeper than three (3) horizontal to one (1) vertical, and on that side shall not be deeper than three (3) feet, from which point the bottom of the pit may slope away from the berme on a slope not steeper than seven (7) feet vertical in one hundred (100) feet horizontal for one hundred (100) feet, at which point and beyond, the depth of the pit, for such width as may be required to supply material for the embankment, shall not exceed ten (10) feet below the natural surface of the ground. At intervals not greater than three hundred (300) feet, "traverses" of the natural surface of the ground, not less than twenty (20) feet wide, shall be left undisturbed, extending entirely across the pits, except that a ditch of such dimensions as may be directed by the engineer in charge shall be cut through the "traverses," on the side of the pit next to the river, to allow drainage from one pit to another. He shall plant the entire surface of the completed embankment with living roots or sods or Bermuda grass, not more than one (1) foot apart, and to the satisfaction of the engineer in charge. He shall cut down all trees, bushes and saplings for a width of one hundred (100) feet on each side of the embankment where it runs through woods or timber, and, in open land, he shall cut down such trees, etc., within one hundred (100) feet of the embankment as the engineer in charge may direct. Unless otherwise directed, he shall cut all trees and stumps within twenty-five feet of the base of the embankment on the land side, down to the level of the ground (but shall not disturb or destroy the engineer's bench marks or other reference points), and shall leave the ground clear of all fallen timber, brush or other debris or material obstructing free passage along the base of the embankment on the land side for a width of twenty-five feet. He shall take care to preserve the engineer's stake and bench marks, and shall at all times keep the station stakes at or opposite their proper location. If required by the engineer in charge, he shall dig a drainage ditch on the land side of the embankment, of such dimensions and at such distance from the base as may be prescribed, but shall not otherwise break up the surface of the ground on the land side of the embankment, except by written permission

of the Engineer in charge. He shall cut such openings through the old embankment or embankments as may be required by the Engineer in charge. When required by the Engineer in charge, the earth taken from openings made through the old embankment and from drainage ditches, shall be deposited in the embankment under construction, in which case it shall be paid for as embankments only, but otherwise it shall be measured and paid for in excavation. Except by special permission of the Engineer in charge, all existing embankments, or parts of old embankments, must be left undisturbed."

In addition to the foregoing, whenever practicable, the following specifications have, during the past two years, been prescribed:

"A sipe ditch or canal, for drainage, shall be required on the land side of the line of levee.....feet from the edge of the base of the levee, excavated to such dimensions and in such manner as may be prescribed by the Engineer in charge. The material (earth) excavated from said ditch or canal may be utilized in the construction of the levee, and when so utilized shall be paid for in embankment, but not otherwise. The ditch or canal shall be left free of all stumps, trees, logs, etc."

"All borrow pit areas shall be cleaned and grubbed to faciliate the observance of specifications governing the dimensions and shape of same."

The grade line usually observed by the levee authorities of the State is that adopted and prescribed by the Mississippi River Commission.

In the matter of cross sections, slopes of 2 and 3 to 1, 3 and 2 to 1, 2½ and 2½ to 1, 3 and 3 to 1, 3 and 4 to 1, and 3 and 10 to 1, with width of crown varying from 4 to 50 feet, dependent upon location, height of levee, stability of bank, whether the bank requires protection by revetment or not, the availability of means, etc., are in practice.

By law, banquettes are required to be built over all bayous or sloughs crossed by levees. Banquettes have also been generally prescribed across depressions of the ground in marked contrast with the general elevation of the natural surface in the vicinity of the levee; also where the general height of a levee exceeds 15 feet. Such banquettes are, as a rule, located along the land side of the line of levee, forming part of its

land side base. A disposition, however, continues to gain favor to as much as possible avoid the construction of banquettes, and, in lieu thereof, adopt flatter slopes.

Where lines of levee are generally exposed to wave-wash, due to wind, the passage of steamers, etc., wooden revetments are, where practicable and the means are available, built and maintained by the State and levee districts.

The United States also, when called upon to protect from wave-wash lines of levees built under its direction, on the "Lower Coast" (the Mississippi River below New Orleans), has, after considering various forms of protection, selected the paving of the entire river side slope of the levee with a layer of concrete.

Thus far, such paving as has been done presents a fine appearance, and is performing its offices satisfactorily.

The earth utilized in building the levees of the State, by the levee districts of the State, still continues to be moved mostly by scrapers drawn by mules. Wagons and graders are, in most instances, used in conjunction with scrapers. Men with wheel barrows, and power driven machinery, in the order named, come next in volume of work accomplished, the latter gaining material ground over former accomplishments.

During the past two years, the work performed by the districts and the State, by the various methods employed, was (exclusive of the Orleans Levee District) as follows: By scrapers drawn by mules, 59.8 per cent; by men with wheel barrows, 21.5 per cent; and by power driven machinery, 18.7 per cent.

The average cost of the levee work performed by the levee districts and the State, by all methods, during the past two years, was (exclusive of the Orleans Levee District) 20.10 cents per cubic yard; and by the three methods named: as follows: By scrapers drawn by mules, 17.30 cents per cubic yard; by men with wheel barrows, 21.5 cents per cubic yard, and by power driven machinery, 22.10 cents per cubic yard.

Supervision, Care and Maintenance of Levees.

The present status of operations, for the supervision, care and maintenance of levees in the State, by the levee districts and the State, is still not materially different from that

described in the previous reports of this Board, and the references to the subject heretofore made are so nearly equally applicable at this time, that the Board of State Engineers takes the liberty of herein again simply reproducing its former remarks under this head, viz:

The work of construction proper having so far generally engaged and almost entirely absorded the attention, efforts and resources of the levee districts of the State, the correlative proposition of supervision, care and maintenance has not everywhere yet received the material thought and consideration which it unquestionably demands.

It has in the past been primarily imperative, on the part of all interested, to build and to enlarge—the care and preservation of the work accomplished being generally regarded as largely a matter of secondary consideration, and, in consequence, has, in many localities, been up to this time treated in a more or less tentative and desultory way.

The Board of State Engineers regards this to be an unwise policy to continue to pursue, and urges a more serious consideration of the subject in the future.

There exists in this State alone to-day, some 1,478.2 miles of levees, monuments to the foresight, broadmindedness, courage and energy of its people, but it cannot be recorded that the safeguards against their abuse and deterioration, provided by law, have everywhere yet been taken advantage of, nor put into practice.

The levee districts of the State and the Police Juries of Parishes within levee districts, are specially charged by law with the duty of protecting, preserving and maintaining the public levees of the State, no matter under what authority constructed; but, for the most part, in some of the levee districts, the authorities in this respect are not making much more than partial efforts, and in others none at all.

The Board of State Engineers, therefore, feels it incumbent upon itself to herein lay stress upon this fact, and to again put itself on record by reiterating its often expressed views on the subject, by urging with renewed emphasis that the time should, beyond question, no longer be delayed by these official bodies in seriously considering and formulating plans for more systematically, comprehensively, economically and ef-

fectively carrying out this fundamental principle of preserving and maintaining their lines of defense against overflow than heretofore.

More systematic organization for the constant supervision, care and maintenance of the levee lines than now prevails must, sooner or later, be adopted, not only by the levee districts, but by the United States as well, and the earlier the better. Work of a more or less serious character, and of greater or less extent, in one place and then another, along all the lines of levees in the State, is needed throughout the course of the year.

Without going into any specific detail about method and appliance, this should be undertaken and performed by permanent forces, suitably organized and properly equipped, on lines similar in most respects to the railroad section-gang system.

The various classes of work required, being also peculiar to the season, each class should and could be thus disposed of during the season when the best results will follow. These section gangs could be made the nucleus of high-water forces in the spring; then, upon the subsidence of the waters, of repair forces, to perform all work of a minor character incident to and following periods of high water, such as removing drift, restoring wave-wash, drainage, resodding embankments, where necessary, and collection and storing all tools and materials. All weed-cutting could, at the proper time, also be done by such gangs, the patrolling of the levee lines at all times, as well as seeing that the laws for their preservation and maintenance are strictly enforced, and perform generally other auxiliary work, even to assisting engineering parties in field operations.

The Levee Districts.

The regularly incorporated levee districts in the State number, at this date, seventeen, all of which, except two—the North Bossier Levee District and the Cat Island Levee District—are in active operation.

All these districts possess corporate powers, exercised under the administration of Boards of Commissioners, varying in number from three to nine; and all, except the Orleans Levee District, are empowered to levy ad valorem taxes for levee purposes, not exceeding the constitutional limit of ten mills

on the dollar. The Orleans Levee District is restricted to an ad valorem tax of one mill on the dollar. Most of the districts also have power to levy assessments or forced contributions upon agricultural products raised within their territory, and upon railroads of standard gauge, while some of them, the boundaries of which touch upon the Gulf Coast, and bays, may impose a local assessment or forced contribution upon oysters. The aggregate of district levee bonds now authorized in all the districts is $8,570,000.00, of which $7,462,500.00 is, at this time, outsanding. The total assessed valuation of the same levee districts, (exclusive of the Cat Island Levee District, in which no local assessments have so far been made), as shown on the tax rolls of 1911, is $318,971,005.00.

A general description of the levee districts in the State, so far authorized by law, with statistical and other information of interest relating to them, follows. It should be explained that the cost of the levee work done during the past two years, and remaining, at this date to be done under existing contracts, shown in the following statements, is, in the first case, inclusive of, and, in the second case, exclusive of, percentages retained until completion.

1. *The Tensas Basin Levee District:* Composed of the Parishes of Morehouse, West Carroll, Richland, Franklin, Catahoula and LaSalle, with those portions of Ouachita and Caldwell Parishes lying East of the Ouachita River. As the overflows to which the district is most liable result from flood waters escaping from the Arkansas and Mississippi River, in Arkansas, authority in law is given to it to apply its resources to the construction, improvement and maintenance of such lines of levee in the State of Arkansas, South of the Arkansas River, as, in the judgment of the Board of Commissioners, concurred in by the Board of State Engineers, are recognized to possess a material bearing upon the protection of the district.

The United States "Upper Tensas District" includes the same levee line, and the larger part of the levee work done on it continues to be contributed by the United States.

The lengths of the lines of levee upon which this district directly depends for protection from overflow, and towards the construction and maintenance of which it directs its financial aid, are as follows: On Amos Bayou Ridge and Cypress

Creek, 12.5 miles; the Mississippi River, from the mouth of Cypress Creek to the State Line, 71.8 miles.

The affairs of the district are conducted by a Board of Commissioners, consisting of eight members, one being appointed from each Parish, or part of Parish, in the district.

The domicile of the Board is at Rayville, Richland Parish, La.

The district taxes and forced contributions permitted by law to be levied and collected in the district are as follows, viz:

Tax: Ad valorem tax of 10 mills on the dollar on all alluvial lands subject to overflow in the district, and possessions, etc., thereon.

Forced Contributions: Five cents per acre on all lands within the district; $60.00 per mile of standard gauge railroad, and $30.00 per mile on railroads of less than standard gauge.

In adition to the foregoing resources of the district, 10 per cent of the General Engineer Fund (17/20 of a mill general State tax) is required by law to be set aside and expended annually in the interest of the district.

The authorized bonded debt of the district is $150,000.00, of which $65,000.00 is, at this time, outstanding.

The assessed valuation on the tax rolls for 1910 and 1911 was $7,338,416.00 and $7,174,448.00, respectively.

The amount and cost of the levee work done in the district, and in that part of Arkansas affecting the district, during the past two years, by the district, and the United States, is approximately as follows:

WORK DONE BY	Miles of		Cubic Yards	COST
	New Levee	Enlargement		
The District	1.58	5.78	771,099	$183,963.85
United States	0.70	4.92	390,007	117,963.10
Totals	2.28	10.70	1,161,106	$301,926.95

The amount and cost of levee work still remaining, at this time, under existing contracts, to be done is approximately as follows: 49,074 cubic yards, to cost about $10,796.28, located as follows: at Lower Lucca, Desha County, Arkansas.

In addition to the foregoing, the district, during the same period expended, in minor repairs, and for the care, preservation and protection of its line generally, about $864.17. However, owing to the exigencies arising from the high water of 1912 to date, the resources of the district for high water expenses are being severely taxed to an extent that cannot at this time be estimated.

The United States, in bank protection work, along reaches of the Arkansas and Mississippi Rivers, in Arkansas, affecting levees in which the Tensas Basin Levee District is interested, also entered upon projects involving large outlays of money.

The condition of the line of levee in Arkansas affecting Louisiana, from the point of view of grade, is, at this time, as shown in the following table:

COUNTY	2 to 3 Feet Above High Water	3 to 4 Feet Above High Water	4 to 5 Feet Above High Water	Total Miles In County
	Miles	Miles	Miles	
Desha	12.5	2.9	17.4	32.8
Chicot	14.8	26.2	13.9	55.9
Totals	27.3	29.1	31.3	87.7
Percentages	26%	28%	46%	

2. *The Fifth Louisiana Levee District:* Composed of the Parishes of East Carroll, Madison, Tensas and Concordia.

That part of the levee in the district, extending from the Arkansas Line to a point opposite Warrenton, Miss., is included in the United States "Upper Tensas District," and that below said point, extending to the mouth of Red River, coincides with the United States "Lower Tensas District."

The total length of the levee line in the district at this date is about 241.1 miles, the present lower terminus of the system being within eight miles of the mouth of Red River.

The affairs of the district are conducted by a Board of

Commissioners composed of eight members, two from each Parish.

The domicile of the district is at Delta, Madison Parish, La.—postoffice address of the President of the Board of Commissioners, Tallulah, La.

The district taxes and forced contributions permitted by law to be annually levied and collected in the district are as follows, viz:

Tax: Ad valorem tax of 10 mills on the dollar on all alluvial lands subject to overflow in the district, and possessions thereon.

Forced Contributions: Five cents per acre on all land within the district; $100.00 per mile on railroads of standard gauge, $20.00 per mile on railroads of less than standard gauge, and $1.00 per bale on all cotton grown within the district.

The authorized bonded debt of the district, all of which is outstanding, is $500,000.00.

The assessed valuation of the district on the tax rolls of 1910 and 1911 was $8,795,310.00 and $8,619,245.00, respectively.

The amount and cost of the levee work done in the district during the past two years, by the district, the State and the United States, is approximaely as follows:

WORK DONE BY	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
The District	2.89	16.89	1,393.362	$239,774.73
The State	3 52	10.17	877,248	219,839.07
The United States	5.29	22.25	1.761,648	328,954.76
Totals	11.70	49.31	4.032,258	$788,568.56

The amount and cost of the levee work still remaining, at this time, under existing contracts, to be done in the district is approximately as follows:

By the District	1,733,465 Cubic Yards	Costing $329,843.59
By the State	478,464 Cubic Yards	Costing 88,843.74
Totals	2,211,929 Cubic Yards	Costing $418,687.33

This work is located as follows: At Wyly to Hollybrook, Villa Vista, Section 1, Biggs, Reid, Delta to Martin, Martin, Ingefield, Kempe, Hodges, Diamond Island and Claremont.

In addition to the foregoing, the district, during the same period, expended in minor repairs and for the care, protection and preservation of its line of levee generally, including drainage of battures, etc., $14,780.90. No expenditures for protection work during high water were made by this district during the past two years, until the high water of 1912, the demands for which have been and are still very great, but cannot at this time be stated in figures.

The United States assumed the construction of and accomplished much in the way of bank protection work in the district, also, during the past two years, involving further large expenditures.

The condition of the levee line in this district, with regard to grade, is at this time about as shown in the following statement, viz:

Parish	1 to 2 Feet above High Water	2 to 3 Feet above High Water	3 to 4 Feet above High Water	4 to 5 Feet above High Water	5 to 6 Feet above High Water	6 Feet and Over above High Water	Total Miles in Parish
	Miles	Miles	Miles	Miles	Miles	Miles	
East Carroll	-------	-------	21.7	34.7	-------	-------	56.4
Madison	-------	2 3	8.9	24.7	7.4	-------	43.3
Tensas	-------	-------	6.3	6.4	45.2	0.2	58.4
Concordia	-------	12.2	14.0	8.1	28.7	20.0	83.0
Totals	-------	14.5	50.9	73.9	81.6	20.2	241.1
Percentages	-------	7%	21%	30%	33%	9%	-------

(Provisional grade recommended by the Mississippi River Commission: 4.0 feet above high water in East Carroll and Madison Parishes; 5.0 feet above at Bedford; 5.5 feet above at L'Argent; 6.1 feet above at Vidalia, and 5.1 feet above at Bougere, with light topping of 1½ feet in addition, from the Arkansas State line to opposite Warrenton, Miss.)

(3) *The Atchafalaya Basin Levee District:* Composed of the Parishes of Pointe Coupee, West Baton Rouge and Terrebonne, and parts of the Parishes of Iberville, Ascension, Assumption, Lafourche, St. Martin, St. Mary, Iberia and St. Landry.

The district coincides with the United States "Atchafalaya District."

The district has a frontage on the right bank of the Mississippi River of 122.0 miles, extending from Torras to Donaldsonville; on Old River, of 6.0 miles; and on the Atchafalaya River, along its left bank, from Barbres to its mouth, of about 160.0 miles, and of about 120.0 miles on its right bank, extending from Bayou Courtableau to the mouth of the river, of which only about 44.0 miles of the left bank of the river, from Barbres to a point about two miles below Bayou Alabama, are yet leveed. The lengths of levee line in the district are as follows: On the Atchafalaya River, 43.9 miles; on Old River, 5.7 miles; on the Mississippi River, 121.5 miles, and on Bayou Lafourche, about 75.0 miles. Since December 10th, 1903, however, Bayou Lafourche has been separated from the Mississippi River, by the construction of an earthen dam (preliminary to the construction of locks), and, therefore, the bayou is no longer subject to the fluctuations which rendered a levee line necessary along its banks.

The affairs of the district are conducted by a Board of Commissioners, consisting of seven members, three of whom are appointed from the Mississippi River Parishes, three from the interior parishes and one at large on the recommendation of the railroads of the district.

The domicile of the district is at Port Allen, West Baton Rouge Parish, La.

The district taxes and forced contributions permitted by law to be annually levied and collected in the district are as follows, viz:

Tax: Ad valorem tax of 10 mills on the dollar on all alluvial land subject to overflow in the districts, and possessions thereon.

Forced Contributions: Two and a half cents per acre on all land within the district; $60.00 per mile of railroad line; 25 cents per 1,000 pounds of sugar; 7½ cents per barrel of syrup; 5 cents per barrel of molasses; 4 cents per ton of cane when same is removed from the limits of the district, and beyond the limits of any district in the State; 25 cents per bale of cotton; 2 cents per 100 pounds of seed cotton, when same is removed from the limits of the district, and beyond the limits of any other levee district of the State; 1½ cents per sack of rough rice.

The authorized bonded debt of this district is $1,000,000.00, of which $850,000.00 is, at this time, outstanding.

The assessed valuation of the district, on the tax rolls of 1910 and 1911, was $24,897,127.00 and $25,148,951.00, respectively.

The amount and cost of the levee work done in the district during the past two years by the district, the State and the United States, is, approximately as follows:

WORK DONE	Miles of New Levee Built	Miles of Levee Raised and Enlarged	Cubic Yards of Earthwork	COST
ON THE MISSISSIPPI RIVER				
By the District	4.12	0.84	692,548	$115,681.59
By the State	1.78	1.08	327,671	56,301.00
By the United States	0.97	-----	265,189	50,915.74
Total	6.87	1.92	1,285,408	$222,898.33

ON THE ATCHAFALAYA RIVER.

By the District	1.97	5.33	521,884	$178,375.49
By the State	0.06	------	11,740	2,500.00
Total	2.03	5.33	533,624	$180,875.49

RECAPITULATION THROUGHOUT THE DISTRICT.

By the District	6.09	6.17	1,214,432	$294,057.08
By the State	1.84	1.08	339.411	58,801.00
By the United States	0.97	------	265,189	50,915.74
Total	8.90	7.25	1,819,032	$403,773.82

The amount and cost of levee work still remaining, at this time, under existing contracts, to be done in the district, by the district, and by the State is as follows:

By the District	316,082 cubic yards	Amounting to $48,360.06
By the State	139,053 cubic yards	Amounting to 30,042.74
Total	455,135 cubic yards	Amounting to $78,402.80

This work is located about as follows: At Levert (upper and lower), Ascension-New Hope, Holloway to Sherman Bayou, Hudson and Haygood.

In addition to the foregoing, the district, during the same period, expended in minor repairs, and for the care, preservation and protection of its line of levees generally, $11,205.39, and for protection work during high water only $4,724.25. The demand for expenditures for this character of work, during the present high water, however, will materially add to this.

The condition of the line of levee in this district, on the

Mississippi River, with regard to grade, is, at this time, about as shown in the following statement, viz:

PARISH	2 to 3 Feet Above High Water	3 to 4 Feet Above High Water	4 to 5 Feet Above High Water	5 to 6 Feet Above High Water	Total Miles in Parish
	Miles	Miles	Miles	Miles	
Pointe Coupee	0.2	1.7	34.1	14.1	50.1
West Baton Rouge	0.3	3.6	26.3	7.9	38.1
Iberville	1.0	0.4	24.6	2.0	28.0
Ascension	------	1.5	7.1	2.4	11.0
Totals	1.5	7.2	92.1	26.4	127.2
Percentages	1%	6%	72%	21%	

(Provisional grade recommended by the Mississippi River Commission: 4.3 at Red River Landing, and 4.2 at Donaldsonville, above high water.)

(4) *The Cat Island Levee District:* Situated in the Parish of West Feliciana. It comprises the territory on the East bank of the Mississippi River from Ratcliff's Landing to Bayou Sara. It was created by Act 110 of 1894, which provided for the appointment of five Levee Commissioners, and authorized the issuance of bonds to the amount of $100,000.00.

As stated in previous reports, surveys have shown that the cost of the levees necessary for the protection of this ditrict would be excessive as compared with the probable revenues, and that, even after building an effective levee system, the drainage of the district during prolonged periods of high water could only be maintained by the operation of costly pumping machinery. Under these circumstances, no action has ever been taken by the Commissioners for raising funds or for undertaking levee work.

(5) *The Pontchartrain Levee District:* Composed of the alluvial lands on the East bank of the Mississippi River, between the cities of Baton Rouge and New Orleans, consisting of parts of the Parishes of East Baton Rouge, Iberville, Ascension, St. James, St. John, St. Charles and Jefferson. Its situation is so favorable as to make it dependent for protection solely upon the integrity of its 126.1 miles of levee line on the Mississippi River front of the district, and upon its "Upper Protection" levee, extending from the main line of levee on the Mississippi River, back to the highlands.

The district is included in the United States "Pontchartrain District."

The affairs of the district are conducted by a Board of Commissioners consisting of nine members, one from each Parish in the district, and one representative, respectively, of the Illinois Central Railway Company, and of the Louisville, New Orleans & Texas Railway Company.

The domicile of the district is at Convent, St. James Parish, La.

The district taxes and forced contributions permitted by law to be annually levied and collected in the district are as follows, viz:

Tax: Ad valorem tax of 10 mills on the dollar on all alluvial land subject to overflow, and possessions thereon.

Forced Contributions: Three cents per acre on all land other than that cultivated in sugar, cotton or rice (except swamp land subject to tidal overflow); 15 cents per barrel of sugar; 50 cents per hogshead of sugar; 5 cents per barrel of molasses; 3 cents per sack of rough rice; 50 cents per bale of cotton; 7½ cents per ton of sugar cane, grown in the district and removed therefrom before being converted into sugar; 4 cents per 100 pounds of seed cotton, grown in the district and removed therefrom; $100.00 per mile of main line of railroad.

The authorized bonded debt of the district if $1,000,000.00, of which $730,000.00 is, at this time, outstanding.

The assessed valuation of the district, on the tax rolls of

1910 and 1911, was $10,958,993.00 and $11,091,519.00, respectively.

The amount and cost of the levee work done in the district, during the past two years, by the district, the State and the United States, was approximately as follows, viz:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the District	0.31	0.51	93,094	$16,146.79
By the State	0.56	3.60	287,234	47,012.68
By the United States	1.53	2.95	382,307	61,110.98
Total	2.40	7.06	762,635	$124,270.45

The amount and cost of the levee work still remaining, at this time, under existing contracts, to be done in the district is as follows:

By the District, 25,000 cubic yards, amounting to, $11,250.00.

This work is located as follows: From South Boulevard Street to protection Levee, Parish of East Baton Rouge.

In addition to the foregoing, the district, during the same period, expended in minor repairs, and for the care, protection and preservation of its lines of levee generally, $11,184.91. No expenditures were incurred by the district, during the past two years, for protection work during high water, nor has any material amounts been so far so expended during the present high water.

The condition of the line of levee in this district, with regard to grade, is, at this time, about as shown in the following statement, viz:

PARISH	3 to 4 Feet Above High Water	4 to 5 Feet Above High Water	5 to 6 Feet Above High Water	Total Miles in Parish
	Miles	Miles	Miles	
East Baton Rouge	0.8	10.7	2.6	14 1
Iberville	0.4	24.7	1.5	26.6
Ascension	0.2	18.8	----------	19.0
St. James	----------	23.1	----------	23.1
St. John	7.4	6.6	0.3	14.3
St. Charles	4.3	12.5	----------	16.8
Jefferson	9.9	1.7	----------	11.6
Totals	23.0	98.1	4.4	125.5
Percentages	18%	79%	3%	----------

(Provisional grade recommended by the Mississippi River Commission: 4.6 at Baton Rouge, and 4.0 at upper line of Orleans Parish, above high water.)

(6) *The Lafourche Basin Levee District:* Composed of all the alluvial lands, except the Parish of Orleans, lying between Bayou Lafourche, the Mississippi River and the Gulf of Mexico, and those parts of the Parishes of Ascension, St. James, St. John, St. Charles, Jefferson and Plaquemines, lying on the right or West bank of the Mississippi River, from Donaldsonville to the lower line of Riceland Plantation, and of the Parishes of Ascension, Assumption and Lafourche, lying on the left bank of Bayou Lafourche, from Donaldsonville to "Chere Ami Canal."

The lengths of the levee lines in this district are: On the Mississippi River, 119.8 miles; and on Bayou Lafourche, 74.1 miles. As in the case of the Atchafalaya Basin Levee District, the Lafourche Levee District is no longer directly subject to overflow from Bayou Lafourche, rendering a levee line along its banks unnecessary, so long as the dam at the head of the bayou, at Donaldsonville, is maintained, or locks be substituted therefor.

The district is included in the United States "Lafourche District," and part of the United States "Barataria District."

The affairs of the district are conducted by a Board of Commissioners, composed of nine members, one from each parish

or part of parish in the district, and one in the district at large, appointed on the recommendation of the railroads of said district.

The domicile of the district is at Gretna, Jefferson Parish, La.

The district taxes and forced contributions permitted by law to be annually levied and collected in the district are as follows, viz:

Tax: Ad valorem tax of 10 mills on the dollar on all alluvial lands subject to overflow in the district, and possessions thereon.

Forced Contributions: 2½ cents per acre on all land; $100.00 per mile on all standard gauge line of railroad operated by steam, excepting railroads the total length of which in the State is less than 100 miles, upon which the rate shall be $50.00 per mile; 10 cents per barrel of sugar; 25 cents per bale of cotton; 35 cents per hogshead of sugar; 7½ cents per barrel of syrup; 5 cents per barrel of molasses; 2½ cents per sack of rough rice; ½ cent per bushel of esculents; 2½ cents per barrel of oranges.

The authorized bonded debt of the district, all of which is outstanding, is $500,000.00.

The assessed valuation of the district, on the tax rolls of 1910 and 1911, was $15,525,858.00 and $15,653,837.00, respectively.

The amount and cost of the levee work done in the district, during the past two years, by the District, the State and the United States, is as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the District	0.20	0.98	24,341	$ 5,076.31
By the State	1.56	2.46	264,358	48,651.10
By the United States	1.08	0.52	112,045	13,425.82
Totals	2.84	3.96	400,744	67,153.23

The amount and cost of the levee work still remaining, at this time, under existing contracts, to be done, is as follows:

By the State, 93,216 cubic yards, amounting to $19,295.71.

This work is located as follows: At Parish Line to Belle Chasse Levee, Plaquemines Parish.

In addition to the above, the district, during the same period, expended in minor repairs and for the care, preservation and protection of its line of levee generally $17,849.35, and in protection work during high water $5,220.45. To the latter will be added a material sum for protection work during the present high water.

The condition of the line of levee in this district, with regard to grade, is, at this time, about as shown in the following statement:

PARISH	1 to 2 Feet Above High Water	2 to 3 Feet Above High Water	3 to 4 Feet Above High Water	4 to 5 Feet Above High Water	5 to 6 Feet Above High Water	Total Miles in Parish
	Miles	Miles	Miles	Miles	Miles	
Ascension	------	------	0.2	6.4	0.7	7.3
St. James	------	0.2	0.3	21.1	------	21.6
St. John	------	1.5	13.4	------	------	14.9
St. Charles	------	5.8	5.4	6.4	0.4	18.0
Jefferson	1.1	4.9	8 5	5.4	------	19.9
Plaquemines	2 7	12.7	14.9	5.0	------	35.3
Totals	3.8	25.1	42.7	44.3	1 1	117.0
Percentages	3%	21%	36%	39%	1%	-------

(Provisional grade recommended by the Mississippi River Commission: 4.2 at Donaldsonville, 4.0 at New Orleans and 3.5 at Riceland above high water.)

(7) *The Orleans Levee District:* In response to the request of the Board of State Engineers, for information in regard to the operations of the Orleans Levee District, during the past two years, a report, under date of April 1st, 1912, was received from the Hon. Jules C. Koenig, President of the Board of Commissioners of the Orleans Levee District, which is so complete and comprehensive that the Board of State Engineers is pleased to reproduce it in full, as follows, viz:

"State of Louisiana.
"Office of the Board of Levee Commissioners,
of The Orleans Levee District,
"Suite No. 201, New Orleans Court Building.

"New Orleans, La., April 1st, 1912.

"Major F. M. Kerr, Chief State Engineer, City.

"Sir—The Board of Levee Commissioners of the Orleans Levee District has the honor to submit for your information the following report with accompanying appendices, covering the period from April 1st, 1910 to April 1st, 1912:

DUTIES AND PERSONNEL OF THE BOARD.

"The Board of Levee Commissioners of the Orleans Levee District was created by Act 93 of the General Assembly of the State of Louisiana, approved July 7th, 1890. Under the provisions of this act, the parish of Orleans was 'formed into a public levee district,' and a Board of Levee Commissioners composed of nine persons possessing all the requisites of a qualified elector in said parish, administer the affairs of the district, seven of whom are appointed by the Governor of the State from the several municipal districts of the City, and two (the Mayor and Commissioner of Public Works of the City of New Orleans) being ex-officio members of the Board.

"The said Board of Levee Commissioners is charged with the construction and repairs and invested with the control and maintenance of all levees in the said Orleans District, whether on river, lake, canal or elsewhere. The said Board of Levee Commissioners, as to location, construction and repairs of all levees on the river front of said district, shall first have the approval in writing of the State Board of Engineers.

LENGTH OF LEVEE LINES.

"The public levee lines of the district lie on both sides of the Mississippi River, that on the left or East bank being 12.09 miles, and that on the right or West bank 13.63 miles in length. The District also maintains lines of 'Rear Protection Levee' aggregating about 46.8 miles in length.

"The domicile of the Board is in the City of New Orleans;

at present it occupies suite No. 201, New Orleans Court Building, at the corner of Royal and St. Louis Streets.

GRADES OF LEVEES.

"Of the 12.09 miles of levee on the left, or east bank, 5.32 miles, or 44 per cent, of the line is 4 to 5 feet above the highest water of record, 1903; 3.85 miles, or 31.8 per cent, is 3 to 4 feet; 1.62 miles, or 13.4 per cent, is 2 to 3 feet; and 1.3 miles, or 10.8 per cent, is 1 to 2 feet.

"Of the 13.63 miles on the right, or west bank, 1.9 miles, or 14 per cent of the line is 4 to 5 feet above the highest water of record, 1903; 0.96 miles, or 7 per cent, is 3 to 4 feet; 5.22 miles, or 38 per cent, 2 to 3 feet; 4.85 miles, or 36 per cent, is 1 to 2 feet; 0.7 miles, or 5 per cent, is 0 to 1 foot.

"In consequence of the low grades and other defects of a more or less serious character, here and there, the Orleans Levee District, in response to public demand, some five years ago inaugurated a movement to improve and maintain as rapidly as possible its levee lines along the Mississippi River to the grades and sections as recommended at that time by the Board of State Engineers.

FORMULA OF THE BOARD OF STATE ENGINEERS.

"In general terms, this formula proposed an embankment of earth to be built and maintained to a grade not less than five (5) feet above the high water of 1903, with a crown not less than fifty (50) feet wide, river side slope not steeper than three horizontal to one vertical, and land side slope not steeper than ten horizontal to one vertical; the flattening of slopes and widening of crown beyond these limits to be governed by the special requirements of what is known as the 'Commercial Front,' on the left or east bank of the river. On the right or west bank of the river the levees to be raised and enlarged to a grade five (5) feet above the high water of 1903, with crown ten feet wide; river side slope not steeper than three horizontal to one vertical; land side slope not steeper than four horizontal to one vertical.

"Vide exhibits 'C-1' and 'C-2' following.

PROVISION OF FUNDS.

"To carry out this project, necessarily involved a large outlay of money for the payment of property appropriated. Since the inauguration of the movement on June 4th, 1907, brought about through the combined efforts of Hon. N. C. Blanchard, then Governor of the State, Hon. C. C. Cordill, State Senator, His Honor Martin Behrman, Mayor of the City of New Orleans, et als. to improve and maintain the line of levee along the Mississippi River protecting the City of New Orleans from overflow as rapidly as practicable, and to the extent of all available funds derived for this purpose, the summary will show, as per attached statement, that up to date some $4,523,078.79 has been expended, which amount is divided as follows:

"First—By contract work undertaken in construction and enlargement of certain stretches of the levee line on the Mississippi River, amounting to 1,668,718.5 cubic yards of earth, and 1,264,145 feet of creosoted revetment, at a cost of $994,971.28, which includes also $8,612.44 for the demolition of the H. T. Lawler Milling & Trading Co., Ltd. Concrete Flour Mill.

Second—Maintenance, repair and operating expenses, approximately $361,478.09. Interest on bonds Approximating $543,300.00, and some $2,623,329.42 have been paid out for the purchase of property, which includes some $415,447.73 of outstanding certificates issued for appropriation of property, bearing five (5) per cent interest; so far averaging, as shown by the work undertaken since the inception of the project, nearly three times as much as the cost of the levee work itself.

"The district appealed to the General Assembly of the State of Louisiana in 1908, and succeeded in having its previous bonded indebtedness of $500,000.00 increased to $3,000,000.00, this amount is outstanding. The other sources of revenue are derived from the District tax authorized and permitted by law, which is an annual ad valorem tax of one mill on the dollar on all property subject to taxation in the district, and the annual allotment by the State of $10,000.00 from the General Engineer Fund. The assessed valuation of the district on the tax rolls of 1910 and 1911, was $231,045,937.00 and $233,383,437.00, respectively.

SUMMARY OF WORK DONE IN THE PAST TWO YEARS.

"From the tabulated statement in exhibits it will be seen that expenditures for levee purposes have during the past two years been as follows:

Earthwork: New Levee and enlargement, containing 503,776.0 cubic yards, and costing $166,099.40.

Revetment: 5,167 linear feet of revetment, amounting to 235,201 feet, B.M., and costing $15,200.44.

Maintenance and Repair: General maintenance and repair of levees, labor and material, and other expenses incidental to operation of Board, including salaries of employes $138,-376.22.

"Total expenditure, as above $319,676.06.

FUTURE WORK.

"Whilst the levees have been very much improved since the high water of 1908 considerable work yet remains to be done to bring the line up to grade and section as recommended by the Board of State Engineers, as shown in detailed attached statements, approximately at 2,296,200 cubic yards divided as follows:

Orleans Parish, Left Bank	1,635.00
Orleans Parish, Right Bank	661,200

"Whilst from these statements, it would appear on the surface, to be quite an undertaking, and evolving a large expenditure of money to complete this project of enlargement of the system of levees on the east bank of the river, the handling of earthwork by the use of mechanical devices has reduced the cost of actual levee work over fifty (50) per cent to what it was in the incipiency of the project in 1907. As we progress in our work, we are getting ahead of the Commercial front of the City, and property values to be appropriated in the future, which in the past has taken over three times the amount of money spent on actual construction work, will not in the future consume so heavily the revenues derived for this purpose. This however is based on a conjecture, that the banks of the river will remain permanent.

Bank Protection.

The urgency of the character of work required to protect the banks from caving, and to fix the harbor lines in the Port of New Orleans has long been admitted by the United States Government, and considerable work has been accomplished through appeals to the Government by her Commercial Bodies et als.

"Since the inauguration of this project by the Orleans Levee District, the United States Government has expended in revetments of the banks with sub-aqueous mattress work, some $707,000.00, distributed as follows:

Linear Feet of Bank Protected in New Orleans Harbor From 1907 to Date and Amounts Expended.

	Expended.
Season 1907-1908—	
1,570 lin. ft. protected at Amesville;	
900 lin. ft. protected at Third District Reach	$100,000.00
Season 1908-1909—	
5,937 lin. ft. protected at Third District Reach	150,000.00
Season 1909-1910—	
3,955 lin. ft. protected at Carrollton Bend	100,000.00
Season 1910-1911—	
2,765 lin. ft. protected at Gretna Front;	
3,975 lin. ft. protected at Carrollton Bend;	
1,110 lin. ft. protected at Third District Reach	175,000.00
Season 1911-1912—	
3,090 lin. ft. protected at Third District Reach;	
600 lin. ft. protected at Carrollton Bend;	
2,215 lin. ft. protected at Gretna to Algiers Point;	
2,480 lin. ft. protected at Greenville Bend	182,000.00
Total	$707,000.00

"The Board of Levee Commissioners of the Orleans Levee District have repeatedly announced that if the National Government will undertake the task of bank protection, the District will construct and maintain all the levee lines required. To do this work effectually would require an annual expenditure of $300,000.00 by the United States Government, as recommended by its Corps of Engineers, until the project of bank portection and fixing the harbor lines is completed.

"Very respectfully,
(Signed) Jules C. Koenig, President,
Board of Levee Commissioners of the
Orleans Levee District."

"B,"

Statement comparing elevation of levee lines in the Orleans Levee District with the highest water of record.

	0 to 1 Foot Above High Water	1 to 2 Feet Above High Water	2 to 3 Feet Above High Water	3 to 4 Feet Above High Water	4 to 5 Feet Above High Water	Total Length	Cubic yards required to conform to grade and section prescribed by Board of State Engineers.
	Miles	Miles	Miles	Miles	Miles	Miles	
Orleans Parish, Left Bank	------	1.30	1.62	3.85	5.32	12.09	1,635,000
Orleans Parish, Right Bank	.70	4.85	5.22	.96	1.90	13.63	661,200
Total	.70	6.15	6.84	4.81	7.22	25.72	2,296,200
Percentages:							
Left Bank	------	10.8%	13.4%	31.8%	44%	------	
Right Bank	5%	36%	38%	7%	14%	------	

GRADES.

Grade and Section Recommended by the Board of State Engineers.

Grade: Five (5) net, above high water of 1903.

Section: Left bank crown not less than 50 feet wide; river side slope not steeper than 3 to 1; land side slope not steeper than 10 to 1.

Right bank, crown not less than 10 feet wide, river side slope not steeper than 3 to 1; land side slope not steeper than 4 to 1.

EXHIBIT C-1.

State of Louisiana,
Office, Board of Levee Commissioners of
Orleans Levee District.
New Orleans, La., April 1st, 1912.

Statement showing approximate elevation of levees, above highest water in Orleans Levee District, left or east bank of the Mississippi River; also, approximate quantities of earthwork required to place said line to the Board of State Engineer's grade, which is 5 feet above the highest water (1903), with crown 50 feet wide and slopes 3 to 1 river side and 10 to 1 land side.

LOCALITY	Linear Feet	Feet Above H. W. 1903	Crown 50 Feet Cubic Yards	REMARKS
Upper Protection Levee to Upper Line of Audubon Park	10,382	5	200,000	Completed 10 Ft. Crown
Upper Line of Audubon Park to Joseph Street	6,652	5	120,000	Completed 10 Ft. Crown.
Joseph St. to Napoleon Ave.	5,900	4	339,000	
Napoleon Ave. to Louisiana Ave.	4,570	1	70,000	
Louisiana Ave. to St. Mary St.	6,529	3	105,000	
St. Mary St. to Canal St.	9,000	1.5 to 3	120,000	
Canal St. to Barracks St.	4,780	1.5 to 2.5	132,000	
Barracks St to Port St.	1,960	3	22,000	
Port St. to Montegut St.	1,080	3	11,000	
Montegut St. to Louisa St.	1,240	3 to 5	20,000	
Louisa St. to Kentucky St.	3,816	5	---	Completed 50 Ft. Crown.
Kentucky St. to Egania St.	3,580	2.5 to 3	233,000	
Egania St. to Parish Line	4,337	3 to 5	263,000	
Total	63,826	---	1,635,000	

C-2.

State of Louisiana,
Office, Board of Levee Commissioners of
Orleans Levee District.
New Orleans, La., April 1st, 1912.

Statement showing approximate elevation of levees above highest water in the Orleans Levee District, right or west bank; also approximate quantity of earth required to place said line to the Board of State Engineer's grade, which is 5 feet above the highest water (1903) with crown 10 feet and slopes 3 and 4 to 1.

NAME OF LEVEE. Station to Station.	Linear Feet.	Feet Above H. W. 1903.	Cubic Yards.
Parish Line to Newton Street—			
0 to 21	2,100	2	34,400
Newton Street to Alix Street—			
21 to 34+25	1,325	2	18,800
Alix Street to Pelican Avenue—			
34+25 to 38+45	420	3	2,500
Pelican Avenue to Morgan Avenue—			
38+45 to 51+16	1,271	2	11,500
Morgan Avenue to Bermuda Street—			
51+16 to 58+77	761	3	4,700
Bermuda Street to Algiers Sawmill—			
58+77 to 65+10	633	2	5,000
Algiers Sawmill—			
65+10 to 68+75	365	½	4,000
Algiers Sawmill to S. P. R. R. Yards—			
68+75 to 75+35	660	3	3,800
Southern Pacific Railroad Yards—			
75+35 to 111+80	3,645	½	41,000
S. P. R. R. Yards to United States Naval Station—			
111+80 to 119+40	760	2	7,400
United States Naval Station—			
119+40 to 156+90	3,750	4	.....
U. S. Naval Station to McLellanville—			
156+90 to 175	1,810	2	20,300
McLellanville—			
175 to 192	1,700	3	22,000
Convent Place to Esnard Place—			
192 to 242	5,000	2½	55,400
Aurora—			
242 to 309+83	6,783	3	63,800

EXHIBIT 2-C—Continued.

NAME OF LEVEE. Station to Station.	Linear Feet.	Feet Above H. W. 1903.	Cubic Yards.
Cut-Off—			
309+83 to 330	2,017	1½	21,800
Orleans—			
330 to 412+55	8,255	3	*88,700
Couret Place—			
412+55 to 426+05	1,350	4	11,900
Upper Stanton—			
426+05 to 441+03	1,498	3	18,400
Stanton—			
441+03 to 489+56	4,853	1½	58,700
Shamrock—			
489+56 to 511+56	2,200	3	18,500
Delacroix—			
511+56 to 608+69	9,713	1½	115,200
Lower Delacroix to Upper Beka—			
608+69 to 642+78	3,409	5	11,500
Beka—			
642+78 to 653+31	1,053	2	2,000
Lower Beka New Levee—			
653+32 to 719+63	6,632	5	19,900
Totals	71,963		661,200

*Caving bank; new line of levee in time will be required, approximating 600,000 cubic yards of earth, unless the bank is protected by U. S. Government.

(8) *The Lake Borgne Basin Levee District:* Composed of the alluvial lands on the east bank of the Mississippi River below the City of New Orleans, situated in the Parish of St. Bernard, and in that part of Plaquemines Parish lying North of the lower line of Bohemia Plantation.

The district is included in the United States "Lake Borgne District."

The length of the levee line of this district, all fronting on the Mississippi River, is 48.0 miles.

The affairs of the district are conducted by a Board of Commissioners consisting of three members, one from each Parish in the district, and one representative of the New Orleans and Southern Railroad Company.

The domicile of the district is at New Orleans, La.

The district taxes and forced contribuitons permitted by law to be annually levied and collected in the district are as follows, viz:

Tax: Ad valorem tax of ten mills on the dollar on all alluvial lands subject to overflow in the district and possessions thereon.

Forced Contributions: Five cents on each and every acre of land within the limits of the district susceptible to cultivation; $60.00 per mile of railroad line; 25 cents per bale of cotton; 35 cents per hogshead of sugar; 10 cents per barrel of sugar; 7½ cents per barrel of syrup; 5 cents per barrel of molasses; 2½ cents per sack of rough rice; ½ cent per bushel of esculents; 2½ cents per barrel of oranges produced in said district; 1½ cents per barrel of oysters gathered from the waters within the limits of the district.

The authorized bonded debt of the district, all of which is outstanding, is $100,000.00.

The assessed valuation of the district, on the tax rolls of 1910 and 1911. was $4,349,110 and $4,938,028.00 respectively.

The amount and cost of the levee work done in this district, during the past two years, by the district, the State and the United States, was as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee	Levee Raised and Enlarged		
By the District	0.54	1.63	54,115	$10,530.65
By the State	1.51		130,139	25,307.89
By the United States	1.21	1.76	178,304	15,054.40
Totals	3.26	3.39	362,558	$50,892,94

The amount and cost of the levee work still remaining, at this time, under existing contracts, to be done is as follows:

By the State, 29,543 cubic yards, amounting to $5,527.54.

This work is located as follows: At Linwood, in Plaquemines Parish.

In addition to the foregoing, the district, during the same period, expended in minor repairs, and for the care, preservation and protection of its line of levees generally $51,211.92, and for protection work during high water only $3,883.24. The demand for expenditures for this character of work, during the present high water, however, will materially add to this.

The condition of the line of levee in this district, with regard to grade, is, at this time, about as shown in the following statement:

PARISH	0 to 1 Foot Above High Water	1 to 2 Feet Above High Water	2 to 3 Feet Above High Water	3 to 4 Feet Above High Water	4 to 5 Feet Above High Water	Total Miles in Parish
	Miles	Miles	Miles	Miles	Miles	
St. Bernard	0.1	1.6	7.1	2.0	------	10.8
Plaquemines	1.2	6.0	19.4	9.7	0.9	37.2
Totals	1.3	7.6	26.5	11.7	0.9	48.0
Percentages	3%	16%	55%	34%	2%	------

(9) *The Grand Prairie Levee District:* Composed of the alluvial lands subject to overflow on the left bank of the Mississippi River, embraced within the Parish of Plaquemines, from the lower line of Bohemia Plantation to the lower line of Baptiste Collette Gap.

The district is included in the United States "Lake Borgne District."

The length of the levee line in this district is 31.6 miles.

The affairs of the district are conducted by a Board of Commissioners, consisting of five members.

The domicile of the district is at Point-a-la-Hache, Plaquemines Parish, La.

The district taxes and forced contributions permitted by law to be annually levied and collected in the district are as follows:

Tax: Ad valorem tax of ten mills on the dollar on all alluvial lands subject to overflow in the district, and possessions thereon.

Forced Contributions: One dollar on every arpent front of land within the district facing the Mississippi River; $30.00 per mile of standard gauge of railroad; 25 cents per bale of cotton; 10 cents per barrel of sugar; 35 cents per hogshead of sugar; 5 cents per ton of sugar cane; 7½ cents per barrel of syrup; 5 cents per barrel of molasses; 5 cents per barrel of rough rice; 3 cents per barrel of esculents; 5 cents per barrel of oranges produced within the limits of the district, and 3 cents per barrel of oysters gathered from the waters of the district.

The authorized bonded debt of the district, all of which is outstanding, is $30,000.00.

The assessed valuation of the district, on the tax rolls of 1910 and 1911, was $200,790.00, and $211,210.00, respectively.

The amount and cost of the levee work done in the district, during the past two years by the State and the United States, was as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the State	0.75	1.96	86.836	$30,203.91
By the United States		1.69	38,609	39,875.81
Totals	0.75	3.65	125,445	$70,079.72

The district expended some amounts, in addition to the foregoing, in minor repairs, and for the care, preservation and protection of its line of levee, but no statement in regard to this has been received.

The condition of the line of levee in this district, with regard to grade, is, at this time, about as shown in the following statement, viz:

PARISH	0 to 1 Foot Above High Water	1 to 2 Feet Above High Water	2 to 3 Feet Above High Water	3 to 4 Feet Above High Water	Total Miles in Parish
	Miles	Miles	Miles	Miles	
Plaquemines	4.0		14.9	12.7	31.6
Percentages	13%		47%	40%	

(Provisional grade recommended by the Mississippi River Commission: 3.0 above high water of 1903 at Bohemia, and 3.0 above high water of 1907 at Fort St. Philip.)

(10) *The Buras Levee District:* Composed of the alluvial lands subject to overflow on the right or West bank of the Mississippi River, " in the Parish of Plaquemines, South of a line drawn from the lower line of Riceland Plantation to the limits of Harang Canal on Bayou Lafourche," extending to The Jump.

The district is included in the United States "Barataria District."

The length of the levee line in this district is 33.6 miles.

The affairs of the district are conducted by a Board of Commissioners, consisting of five members.

The domicile of the district is at Buras, Parish of Plaquemines, La.

The district taxes and forced contributions permitted by law to be annually levied and collected in the district are as follows:

Tax: Ad valorem tax of 10 mills on the dollar on all alluvial lands subject to overflow in the district, and possessions thereon.

Forced Contributions: Five cents per acre on all land susceptible of cultivation within the limits of the district; $30.00 per mile of standard gauge of railroad; 25 cents per bale of cotton; 5 cents per ton of cane; 5 cents per sack of rough rice; 2½ cents per barrel of oysters; 2½ cents per bushel of esculents, and five cents per barrel of oranges.

The authorized bonded debt of the district, all of which is outstanding, is $35,000.00.

The assessed valuation of the district, on the tax rolls of 1910 and 1911, was $757,480.00 and $756,370.00, respectively.

The amount and cost of the levee work done in the district during the past two years, was as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the State	1.57	0.46	52,986	$24,957.02
By the United States	0.69	2.20	76,977	9,213.54
Totals	2.26	2.66	129,963	$34,170.56

In addition to the foregoing, the district has expended in minor repairs, and for the care, protection and preservation of its line of levees $11,765.47, and in protection work during high water $1,232.65. In addition to this, the high water of 1912 will impose upon the district considerable expenditures, which it is, at this date, impossible to estimate.

The condition of the line of levee in this district, with regard

to grade, is, at this time, about as shown in the following statement:

PARISH	0 to 1 Foot Above High Watea	1 to 2 Feet Above High Water	2 to 3 Feet Above High Water	3 to 4 Feet Above High Water	Total Miles in Parish
	Miles	Miles	Miles	Miles	
Plaquemines	4.1	9.2	8.5	11.8	33.6
Percentages	12%	27%	26%	35%	

(11) *The Plaquemines Parish East Bank Levee District:* Consists of all the territory contained within the Parish of Plaquemines, on the left or East bank of the Mississippi River, beginning at the upper line of Harlem Plantation and extending to the upper bank of Cusilich Canal, on the property of Peter Cusilich, below the Old Quarantine Station. It is entirely included within the limits of the Lake Borgne Basin Levee District and the Grand Prairie Levee District, so that all parts of it are also parts of another levee district. In this respect, as well as having been constituted "for the purpose of protecting the lands of said district from inundation from the waters of the Gulf of Mexico," the Plaquemines Parish East Bank Levee District differs from any of the levee districts of the State previously created.

The affairs of the district are conducted by a Board of Commissioners, consisting of five members.

The domicile of the district is at Pointe-a-la-Hache, Parish of Plaquemines, La.

The district taxes and forced contributions permitted by law to be annually levied and collected in the district are as follows, viz:

Tax: Ad valorem tax of "10 mills on the dollar of the assessed valuation" of the district. Should this tax prove in-

adequate, the district is further permitted "to levy annually a district tax not to exceed 50 mills on the dollar, on its assessed valuation," provided "that the said Board of Commissioners shall, in accordance with Article 239 of the Constitution of 1898, first submit, without any previous petition, the purpose for the proposed increased levy, and the length of time the same shall be levied, to a vote of the property taxpayers of said district," etc.

Forced Contributions: One dollar per acre on all lands in the district protected from inundation, lying between the Mississippi River and the Gulf Coast levees; $30.00 per mile of standard gauge railroad; 25 cents per bale of cotton; 10 cents per barrel of sugar; 35 cents per hogshead of sugar; 5 cents per barrel of molasses; 5 cents per barrel of rough rice; 3 cents per barrel of vegetables and fruits other than oranges; 5 cents per barrel of oranges.

The authorized bonded debt of the district, all of which is outstanding, is $155,000.00.

The assessed valuation of the district, on the tax rolls of 1910 and 1911, was $249,750.00 and $233,850.00, respectively.

The amount and cost of levee work done in the district, during the past two years by the district and the State, was as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the District	5.29	1.37	190,936	$25,065.92
By the State	0.06	22.30	201,203	40,258.64
Total	5.35	23.67	392,139	$65,324.56

The amount and cost of the levee work still remaining, at this time, under existing contracts, to be done in the district is as follows:

By the State, 5,050 cubic yards, amounting to $1,085.75.

The work is located as follows: On Gulf Coast Levee Plaquemines Parish.

The damage done to the Gulf Coast Levee, during the storm of 1909, as described in the bi-ennial report of the Board of State Engineers, April 20th, 1910, has practically been fully remedied. In fact, but for a few sloughs, here and there, which have occurred since the levee has been restored, and will be corrected as soon as practicable, the levee, as far as the earthwork is concerned, may be regarded as completed as designed.

(12) *The Caddo Levee District:* All alluvial land, and all lands subject to or liable to overflow from the waters of Red River, or its tributaries, or its outlets, situated in the Parish of Caddo, not including such lands as occur within the corporate limits of the City of Shreveport, are embraced within the boundaries of this district.

The length of the levee lines in the upper and lower systems of this district aggregate 86.3 miles.

The affairs of the district are conducted by a Board of Commissioners consisting of seven members.

The domicile of the district is at Shreveport, La.

The district levee taxes and forced contributions permitted by law to be annually levied and collected in the district, are as follows:

Tax: Ad valorem tax of 10 mills on the dollar on all alluvial land subject to overflow in the district and possessions thereon.

Forced Contributions: Five cents per acre on all land within the district; $60.00 per mile of railroad; and 50 cents per bale of cotton.

The authorized bonded debt of the district is $300,000.00, of which $247,500.00 is, at this time, outstanding.

The assessed valuation of the district, on the tax rolls of

1910 and 1911, was $1,114,620.00 and $1,245,975.00, respectively.

The amount and cost of the levee work done in the district during the past two years, by the district was as follows:

WORK DONE	Miles of		Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the District	5.25	2.11	410,173	$58,026.69
Total	5.25	2.11	410,173	$58,026.69

The amount and cost of levee work, remaining, at this time, under existing-contracts, to be done in the district, is as follows:

By the District, 285,920 cubic yards, amounting to $39,944.64. This is located at Cuba to Mulhaupt, and Twelve Mile Bayou to Cross Bayou.

There were no expenditures in this district, for repair work, etc., during the past two years.

The general condition of the levee lines in this district is, at this time, good, though more attention to preservation, care and maintenance is necessary. Again, quite a length of line, from the State line down to a point below Dooley Bayou, has, in consequence, of an impending increase in future flood levels, along that part of Red River, by reason of the ultimate leveeing up of Red River, in Arkansas, been recommended by the Board of State Engineers. This recommendation, involving the construction of some 900,000 cubic yards of earthwork, the Caddo Levee District has accepted, the surveys have been made by the Board of State Engineers, and proposals, to be received up to 12 o'clock noon, Wednesday, April 24th, 1912, to construct the work, invited by advertisement.

The district has also in contemplation, as a part of the plan under which the new levee from Cuba to Mulhaupt places, and from the westerly bank of Twelve Mile Bayou to Cross Bayou, already under construction, the excavation of a drainage channel from Twelve Mile Bayou about opposite the lower end of Gilmer's Ditch, to Cross Bayou, as a substitute for Twelve Mile Bayou when the latter, under authority from the United States, may be closed at its present entrance into Red River. This work will add some 1,500,000 cubic yards of earthwork to that already practically under way by the district at this time.

(13) *The North Bossier Levee District:* All the alluvial lands subject to overflow from the waters of Red River or its tributaries or outlets, in the Parish of Bossier, bounded on the North by the Arkansas-Louisiana State line, on the East by the hills or uplands, on the South by the Southern boundary of Section Nine (9), Ten (10), Eleven (11) and Twelve (12) of Township Twenty-two (22) North, Range Fourteen (14) West, and on the West by Red River, are embraced with in the boundaries of this district.

The control and management of the district is vested in a Board of Commissioners, consisting of five members.

The domicile of the district is at Plain Dealing, Bossier Parish, La.

The district levee taxes and forced contributions permitted by law to be annually levied and collected in the district are as follows, viz:

Tax: A district levee tax of 10 mills on the dollar of the assessed valuation of all the property in the district subject to taxation for levee purposes.

Forced Contributions: Fifteen cents per acre on all land; $100.00 per mile of railroad lines; $1.00 per bale of cotton.

The authorized bonded debt of the district, none of which is as yet outstanding, is $200,000.00.

The assessed valuation of the district, on the tax rolls of 1910 and 1911, was $29,820.00 and $27,270.00, respectively.

No levee work has yet been undertaken in this district, by the district or the State, due to the fact that its Board of

Commissioners is waiting upon the Long Prairie Association of Arkansas to complete its system down to the State line. The North Bossier Levee District, owing to its location and geographical configuration, naturally forms the lower end of a levee district which should have its head at Long Prairie, in Arkansas, and its lower end at Posten Bayou, in Louisiana. But the fact that part of the district was in one State and part in another, precluded the practicability of forming it into one levee district. This was especially so as that part in Louisiana (the lower end) is much the smaller. An understanding has, however, been reached to the effect that just as soon as the Arkansas district completes a continuous system from the highlands at Long Prairie down to the Louisiana line, the North Bossier Levee District will take up the work and continue the levee on down as far as its resources will permit.

This condition has not yet been brought about.

(14) *The Bossier Levee District:* All alluvial lands subject to or liable to overflow from the waters of Red River, or its tributaries or outlets in the Parish of Bossier, South of the line dividing the North half from the South half of Township 29 North, are embraced within the boundaries of the district.

The length of the levee line in this district is 48.0 miles.

The affairs of the district are conducted by a Board of Commissioners consisting of seven members.

The domicile of the district is at Bossier City, Bossier Parish, La.

The district levee taxes and forced contributions permitted by law to be annually levied and collected in the district are as follows, viz:

Tax: Ad valorem tax of 10 mills on the dollar on all alluvial lands subject to overflow in the district and possessions thereon.

Forced Contributions: Five cents on every acre of land in the district; $60.00 per mile of railroad; 50 cents per bale of cotton.

The authorized bonded debt of the district is $400,000.00, of which $350,000.00 is, at this time, outstanding.

The assessed valuation of the district, on the tax rolls of 1910 and 1911 was $1,792,425.00 and $1,762,570.00, respectively.

The amount and cost of the levee work done in the district during the past two years, was as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the State	0.71	---	49,364	$6,165.56
Total	0.71	---	49,364	$6,165.56

Preservations, care and maintenance, in the Bossier Levee District, for some years past, attributable to lack of funds has not received the necessary attention. Otherwise, the district could be said to also possess a good line of levee.

Funds to inaugurate and carry on a systematic and comprehensive plan of operations, to preserve, care and maintain the lines of levee in the Bossier Levee District, are imperatively needed, to check a tendency to material impairment which cannot, otherwise, fail to result.

(15) *The Red River, Atchafalaya and Bayou Boeuf Levee District:* Under the act of incorporation of this district, all the territory in the Parishes of Rapides and Avoyelles, and in that part of the Parish of St. Landry, situated between the Atchafalaya River on the East, and Bayous Boeuf and Courtableau on the West and South, is subject to its operations.

During the years 1890 and 1891, however, by due process of law, all that section of Rapides Parish, above Alexandria, bounded by Bayous Rapides and Jean de Jean and Red River, and all parts of the Parish of Avoyelles, situated on the left bank of Red River, as well as that part of the parish bounded by Bayou des Glaizes, the Atchfalaya and Red Rivers, and the public road running from David's Ferry, on Red River, to Bayou des Glaizes by way of Marksville, Mansura and the

"Long Bridge," at Bout de Bayou, have been exempted from the operations of the act of incorporation of the district.

The lengths of the lines of levee in the three systems in this district aggregate 130.7 miles.

The affairs of the district are conducted by a Board of Commissioners consisting of three members, one from each Parish in the district.

The domicile of the district is at Alexandria, La.

The district levee taxes and forced contributions permitted by law to be annually levied and collected in the district are as follows, viz:

Tax: Ad valorem tax of 10 mills on the dollar on all lands and other property in the district subject to taxation for levee purposes.

Forced Contributions: Five cents per acre on all land in the district; $60.00 per mile of railroad.

The authorized bonded debt of the district, all of which is outstanding, is $500,000.00.

The assessed valuation of the district, on the tax rolls of 1910 and 1911 was $7,894,950.00 and $7,928,525.00 respectively.

The amount and cost of the levee work done in the district, by the district and the State, during the past two years, was as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the District	1.97	---	208,344	$45,597.88
By the State	8.99	2.47	402,850	80,897.37
Total	10.96	2 47	611,194	$126,495.25

The amount and cost of the levee work still remaining, at this time, under existing contracts, to be done in the district, is as follows:

By the District	113,811 cubic yards	Amounting to $24,728.42
By the State	56,500 cubic yards	Amounting to 12,430.00
Total	170,311 cubic yards	Amounting to $37,158.42

This work is located as follows: On the Latanier Extensions, and on the Elba Levee.

During the past two years, this district expended in minor repairs, and for the care, preservation and maintenance of its lines of levee $4,748.74, but, until the present high water, nothing for protection during high water. However, it has been and will continue to be called upon during this high water for considerable expenditures for such work on the Atchafalaya River.

The condition of the present maintaining lines of levees in this district is generally good. Improvement in grade and section, along certain stretches, is desirable, but few new levees seem, at this time, to be called for in the near future. Such as are, say at Cut-Off Bayou and Wilsons, on Red River in Rapides Parish, and at Elba on the Atchafalaya River, in St. Landry Parish, have been provided for, the two former by the State, and the latter by the district.

However, considerable work in the form of extensions to existing systems, still remains to be executed, the principal of these being along the South bank of Bayou Rapides, from the Cooper Place to McNutt's Hill, some 12.0 miles, and along the West bank of the Atchafalaya from a point about two miles above Bayou Courtableau, where the system now, for the time being, practically terminates, to Bayou Courtableau, involving some 250,000 cubic yards and 100.000 cubic yards of earthwork respectively.

(16) *The Red River and Bayou des Glaizes Levee and Drainage District:* All lands in the Parish of Avoyelles, situated between Red River, the Atchafalaya River, Bayou des Glaizes and the public road running from David's Ferry or Moncla's

Ferry, on Red River, to Bayou des Glaizes, by way of Marksville, Mansura and the "Long Bridge" at Bout de Bayou, subject to overflow, are included in this district.

The length of the levee line in this district is, at this time, 27.0 miles.

The affairs of the district are conducted by a Board of Commissioners consisting of three members.

The domicile of the district is at Marksville, Avoyelles Parish, La.

The district levee taxes and forced contributions permitted by law to be annually levied and collected in the district, are as follows, viz:

Tax: Ad valorem tax of 10 mills on the dollar upon all of the property in the district subject to taxation for levee and drainage purposes.

Forced Contributions: Five (5) cents per acre on all land in the district; $60.00 per mile of railroad; 50 cents per bale of cotton.

The authorized bonded debt of the district is $300,000.00, all of which is, at this time, outstanding.

The assessed valuation of the district, on the tax rolls of 1910 and 1911 was $697,300.00 and $663,040.00, respectively.

The amount and cost of the levee work done in the district during the past two years was as follows:

WORK DONE	Miles of New Levee Built	Cubic Yards of Earthwork	COST
By the District	4.0	336,208	$84,052.00
Total	4.0	336,208	$84,052.00

During the past two years the district expended nothing in minor repairs and for the care, protection and preservation of its lines of levees, nor in protection work during high water. However, during the present high water, it will be called upon for some such expenditures.

The condition of the line of levee in this district, as far

as conditions is good. At the present date the completed line extends down to a point 21.5 miles below its head, making extensions of 4.5 miles and 5.0 miles, respectively, to the Red River and Atchafalaya River, estimated to require about 3,000,000 cubic yards of earthwork for the construction to close the mouth of Bayou des Glaizes at Simmsport.

How it remains to be determined whether the old line will ultimately be extended across Bayou des Glaizes and connected with the present controlling system in the Red River, Atchafalaya and Bayou Boeuf Levee District below, or by Bayou des Glaizes to some point superior in elevation to back water from the Atchafalaya River.

In the first instance, the main arteries for drainage in the area, above, would have to be diverted into new channels, and the drainage system South of Bayou des Glaizes greatly improved. Both very desirable.

In the second, the Red River and Bayou des Glaizes Levee and Drainage District, would be deprived of all effective drainage except such as could be obtained by pumping. This would, if possible, be avoided.

The necessity for seriously discussing the situation is, however, not far distant.

In addition to the extensions described, a new levee, in consequence of caving banks, involving the construction of 50,000 cubic yards of earthwork is, at this time, required opposite Ben Ruth Lake, about 6.0 miles below Davis or Mundal's Ferry, the head of the system.

The situation at this point is one which should appeal for bank protection work rather than the construction of a new levee, and an endeavor will be made to induce the United States to undertake the bank protection work needed there.

The necessity for bank protection work rather than the construction of a new levee, arises from the fact that the Avoyelles Prairies, at this point, approach within a short distance of the banks of Red River, Ben Ruth Lake, and a very narrow strip of land only, lying in between. So that the new levee would have to be built in the bed of the lake, where the foundation is uncertain, the levee would be of considerably greater height than the present controlling line, and the cost would be beyond the resources of the local levee authorities.

(17) *The Saline Levee and Drainage District:* All the territory in Avoyelles Parish, consisting of the alluvial lands subject to overflow within the following limits, is embraced within the district, to-wit: Beginning at Cassandria on the line between Sections 44 and 50, Township 3 North, Range 3 East, thence down Red River to Saline Bayou, thence following Saline Bayou, Saline Lake and Horse Pen Creek to line between Sections 17 and 18, Township 4 North, Range 3 East, thence South to the Point Maigre hills, and following the East edge of said hills to the point of beginning.

The length of the line of levee in this district is, at this time, 10.3 miles.

The affairs of the district are conducted by a Board of Commissioners, consisting of three members.

The domicile of the district is at Marksville, Avoyelles Parish, La.

The district taxes and forced contributions permitted by law to be annually levied and collected in the district are as follows, viz:

Tax: Ad valorem tax of 10 mills on the dollar upon all the property in the district subject to taxation for levee and drainage purposes.

Forced Contributions: Five cents per acre on all lands in the district; $60.00 per mile of railroad; 50 cents per bale of cotton.

The authorized bonded debt of the district is $300,000.00, of which $100,000.00 is, at this time, outstanding.

The assessed valuation of the district, on the tax rolls of 1910 and 1911 was $129,220.00 and $132,730.00, respectively.

The amount and cost of the levee work done in the district during the past two years was as follows:

WORK DONE	Miles of New Levee Built	Cubic Yards of Earthwork	COST
By the State	3.50	80,285	$11,632.06
Totals	3.50	80,285	$11,632.06

The amount and cost of levee work still remaining, at this time, under existing contracts to be done in the district, is as follows:

By the State, 25,956 cubic yards, amounting to $3,893.40.

This work is located at Experiment Plantation South, Avoyelles Parish La.

Practically the entire length of line in the district still requires improvement in grade and section. The line should also, as soon as practicable, be extended to at least the lower limits of the district on Red River, at or near the mouth of Saline Bayou, some 7.0 miles below the present terminus of the line.

The district has, during the past two years, practically made no expenditures for the care, preservation and maintenance of its line of levee.

Immediate and Future Needs of the Levee Districts.

It will be noted in the foregoing description of the levee districts of the State, that the estimates of the further enlargement of the controlling lines of levee, and of the new levees required in each, usually given, are herein omitted.

This is due to the fact that an unprecedented period of high water, in nearly all the streams of the State prevails, at this time, and the Board of State Engineers, has deemed it advisable to with hold the preparation and submission of such estimates until after the subsidence of high water, when the estimates may be made to more nearly conform to the existing conditions.

A special supplemental report will, therefore, as soon as justified, follow this report.

The Levee Situation Generally on the Mississippi, Red and Atchafalaya Rivers.

On The Mississippi River.

A review of the condition of the lines of levees, within their present limits, in the several levee districts in Louisiana fronting upon the Mississippi River, as already set forth, under the name of each district, shows, in most directions, continued

improvement, in location, grade, section and character of work performed. Nevertheless, it must still be recognized that, while quite a degree of excellence has been reached on many parts of the system, much yet remains to be accomplished before it can, as a whole, be regarded as in all respects adequate.

As long as the banks of the Mississippi River along its numerous concave bends, are permitted, season after season, to crumble in and carry away long lines of levee, no matter how well located, nor how ideally constructed, and destroy vast areas of property as well, the end of its requirements will never be in sight.

Besides this, from the economic point of view, bank protection work may be said to become more and more imperative in proportion to the degree of improvement accomplished in the levee system itself. The higher the standard to which the levees are constructed, the greater the loss when destroyed by caving banks.

Bank protection work, by the United States, has passed beyond the stage of experiment. It has proven an unqualified success wherever applied. Much of it has already been done by the United States on the Mississippi River in Louisiana. However, much more extended effort is still required in many directions, until the banks of this mighty river are made generally stable, the completion of the levee system, in the course of a limited time, thereby made possible, and the burden of providing for protection from overflow reduced to the simpler problem of preservation, care and maintenance.

The question of bank protection proper applies more seriously and generally to what is commonly called the "Upper River," that is, on the Mississippi River, above the mouth of Red River, though a number of places on the "Lower River," that is, on the Mississippi River below the mouth of Red River, appeal for similar treatment, and some of them have already received such treatment, notably at Plaquemines City, in Iberville Parish, and in the harbor of New Orleans.

On the "Lower Coast," or that part of the Mississippi River below New Orleans, and between there and the Gulf of Mexico, materially receding river banks are comparatively speaking of rare occurrence, but another form of exposure in

high water confronts the river banks and levees on both sides of the river practically throughout its greater length from New Orleans to the Gulf.

This results from waves caused by winds and storms, and by the numerous large ocean giong vessels plying up and down the river. None but those who have witnessed the force and effect of this action upon the banks of the river and the levee lines parrelling them, can realize its seriousness, and the great necessity for works of protection to guard against it.

Thus, as stated before, where the lines of levees on the "Lower Coast" are thus exposed, wooden revetments are, where practicable and the means available, built and maintained by the State and levee districts, in connection with levee work, while the United States, under similar circumstances, covers the entire river side slope of such levees as are undertaken under its dirction, with a layer or pavement of concrete. This entails upon the part of all three very considerable outlays.

On Red River.

The length of Red River in Louisiana, that is, from the Arkansas State line to Old River, is 367.0 miles. Of this length, however, but 250.0 miles, distributed between both banks, has so far been leveed by the authorities; that is, 101.0 by river, in the Caddo Levee District, on the right bank; 61.0 miles in the Bossier Levee District opposite, on the left bank; 75.0 miles in the Red River, Atchafalaya and Bayou Boeuf Levee and the Red River and Bayou des Glaizes Levee and Drainage Districts, on the right bank, and 13.0 miles in the Saline Levee and Drainage District opposite, on the left bank. That is, the upper and lower limits of Red River only have so far received the benefits of levee construction by the State and levee districts, leaving several large stretches of river, and adjacent country in between, where protection from overflow would prove of immense value, still untreated. This is largely due to the fact that riparian owners in this section have not yet availed themselves of the opportunity permitted under the laws of the State to organize into levee districts and obtain the benefits of State aid, to which they would thereby be entitled. A world of levee work is, therefore, still needed on Red River.

Except for some lack of system and comprehensiveness, in the work of the local authorities, here and there, on Red River, in preserving, caring for and maintaining their lines of levees, the latter are, as far as they extend, in good and effective condition.

Red River, like the Mississippi River, also suffers greatly from caving banks. This condition is intensified by its extreme tortuousness, numerous cut-offs, steepness of slope, and, where confined, to the enlargement of section consequent upon confinement.

In the interest of navigation, preservation of riparian lands, and protection from overflow, at large, bank protection work on Red River should be seriously considered and provided for at as early a time as possible.

In fact, the necessity for the consideration of this, and numerous other features connected with the development, control and preservation of Red River as a water-way, in Louisiana and elsewhere in the valley, is growing so patent and urgent as to seem to call for a National Red River Commission, along the same lines as govern with the Mississippi River Commisison.

No comprehensive plan of operation for the benefit of the valley as a whole can well be ever otherwise formulated and carried out, and without such a plan, not only will no material advance in public improvement in the valley as a whole, be likely, but, comparatively speaking, much of the work, here, there and elsewhere, spasmodically done, as occasion permits, with meagre resources, National and local, will continue to be subject to certain waste, through efforts, necessarily more or less tentative and lacking in sequence. Many plans, which, for the time being, may appear, locally, appealing, may equally prove seriously conflicting to the valley at large, when, if ever, the attempt might be made to assemble them into one grand whole.

On The Atchafalaya River.

The Atchafalaya River, from its head, at Barbres Landing, to its mouth, at the Gulf of Mexico, has a length of about 160 mlies. Of this, but 41.0 miles, on the right or West bank, from Simmsport to and across Bayou Bigraw, and 45.5 miles, on the left or East bank, by river, have so far been leveed.

The levees so far built upon the Atchafalaya River are, with few exceptions, in excellent condition.

It is contemplated by the levee authorities to, as rapidly as resources will permit, extend the levee line on the right or West bank of the Atchafalaya River, some 75 miles, on a location practically paralleling the river, to a point on the banks of Bayou Teche, probably, if found practicable, as far South as Charenton Canal. And on the left or East bank, some 15 miles, to the head of Whisky Bay, where, until this section of country contiguous to that bank, below, builds up from the deposits of the river, the terminus of the levee line on the left or East bank must rest. The extension on the left or East bank will involve as much as 1,500,000 cubic yards of earthwork, and that on the right or West bank, dependent upon final location, from 5,000,000 to 8,000,000 cubic yards. In the extension of the levee line on the left or East bank of the Atchafalaya River, to the head of Whisky Bay, no obstacle of any particular moment presents itself. It is simply a matter of opportunity to proceed and resources with which to meet estimates.

The same may, at this time, be said in regard to the extension of the levee line on the right or West bank of the Atchafalaya River. But, for a long while, considerable difference of opinion, locally, not of the wisdom of extending the line, but in regard to the recommendations of the Board of State Engineers, existed. This arose from the fact that, under the directions of the Board of State Engineers, this extension would involve the closure of Bayou Courtableau.

It was, however, known that the principal source of opposition to the recommendation of the Board of State Engineers emanated from the Union Irrigation Company, at Washington, La., under the mistaken apprehension that the closure of Bayou Courtableau would injuriously affect its water supply.

However, at a joint meeting of the Boards of Commissioners of the Atchafalaya Basin and the Red River, Atchafalaya and Bayou Boeuf Levee Districts, at Baton Rouge, on October 25th, 1911, specially called to discuss the subject, Mr. J. Franklin Schell, resenting the Union Irrigation Company, and acting in the capacity of a delegate to the meeting, from the town of Washington, and from the Parish of St. Landry, submitted the following proposition:

"That, provided the Union Irrigation Company were permitted, at its own expense, to place a flood gate in the line of levee at the mouth of the Courtableau, or at some other more suitable point, to maintain, under control, water connection, when needed and permissable, between the Atchafalaya River and Bayou Courtableau, with sills, or waste weirs, across the openings through the South bank of the latter, at elevations that would retain a certain flood level, in the Courtableau, to insure a stated supply, but not sufficient to interfere with the drainage of the country above and into the Courtableau, all objection, in the section represented by him, to the extension of the levee line across the Courtableau, would not only be removed, but the early undertaking and forwarding of the proposition would be accepted with satisfaction."

This, the two districts, upon the recommendation of the Board of State Engineers, agreed to, requiring, however, that the location of the flood gates, and all plans, specifications, etc., for it and such sills or waste weirs, through the South bank of Bayou Courtableau, as might be decided upon, should be subject to the approval of the Board of State Engineers, and the United States Engineer in charge of the district.

On November 14th, 1911, this and other presentations of the proposition were placed before the Secretary of War of the United States, by the two districts, and, under date of December 28th, 1911, authority was received from the Secretary of War of the United States "to extend a levee along the West bank of the Atchafalaya River across Bayou Courtableau, Louisiana, in such a way as to close the mouth of said bayou, at the location and as shown on attached plans."

Therefore, as already expressed, the extension of the line of levee on the right or West bank of the Atchafalaya River is now, as with the extension on the left or East bank, also but a matter of opportunity to proceed and resources with which to meet estimates, and it is, at this time, already contemplated by the two districts interested, assisted by the State, to make provision to proceed with a part of the work after the period of high water in the Atchafalaya River this year.

Separation Of The Red And Atchafalaya Rivers From The Mississippi River.

In the bi-ennial report of the Board of State Engineers, from April 20th, 1908 to April 20th, 1910, after submitting arguments sustaining its advocacy of the proposition to separate the Red and Atchafalaya Rivers from the Mississippi River, the Board recorded itself as follows:

> "Finally, the Board of State Engineers, after weighing all these considerations, is disposed to place itself on record as being in favor of the project, as a general proposition, taken up at the proper time and in its proper order. It certainly would appear to be a logical sequence to all that has gone before in the light of river improvement, from both the standpoint of navigation and protection from overflow."

The conduct of Old River and the Atchafalaya River, during the past two years, has so strengthened the views of the Board of State Engineers, then expressed, that it feels, at this time, constrained to add the direct opinion that the proposed separation should not be delayed any longer than can possibly be avoided.

Old River appears to continue to steadily enlarge at a material rate and the increase in flood levels, at and above the lower ends of the lines of levees on the East and West banks of the Atchafalaya River, at lower stages of the river at Melville than formerly, is, with each recurring freshet in the river, very marked and alarming.

This is due to the fact that, as Old River deepens and increases in section, the influences of rises in the Mississippi River is felt in the Atchafalaya River, at lower elevations, and at earlier and for longer periods than formerly, when the reverse was true. Thus the basin, through which it flows, is, under these conditions, already practically charged with overflow much in advance of the usual period of high water in the Atchafalaya River, in the past, and at such time serious congestion results in the smaller river below not yet reached by confinement by levees, and where enlargement has, therefore, not yet occurred.

The Board of State Engineers is thus lead to fear that this enlargement of Old River must, in time, extend to the Atchafalaya River itself, and possibly to such an extent as to sooner or later

affect the Mississippi River so seriously in regimen as to cause a diversion from its present route to the sea to that occupied by the Atchafalaya River. This would undoubtedly prove a calamity to all South Louisiana.

Again, under any circumstances, a failure to exclude the waters of the Mississippi River from the lower Red River and the Atchafalaya River basins, operates, to almost a prohibitive degree, against the successful development, upon anything like comprehensive and economic lines, of that section of the State from the point of view of protection from overflow, drainage and reclamation.

However, the whole subject matter is in the hands of the Mississippi River Commission for investigation, study and report, and it is known that the Commission has, during the past two years, elaborately surveyed the situation to this end.

It is sincerely to be hoped that the benefit of the investigations of the Mississippi River Commission may be soon enjoyed by the public.

Bayou Lafourche.

During the past two years, the Joint Organization of the Atchafalaya Basin and Lafourche Levee District, charged by law with carrying out certain projects for the improvement of Bayou Lafourche, has confined its operations to such dredging as was demanded to maintain a suitable channel for navigation by such craft as now ply upon that stream, to guarding against congestion by the water hyacinth, and to the maintaining of fresh water connection with Lake Verret.

In regard to the lock near the head of Bayou Lafourche, at Donaldsonville, revised plans and specifications for its construction, on less extensive and simpler lines than at first contemplated, are, at the request and at the expense of the Joint Organization, being, by courtesy, prepared under the direction of Colonel Lansing H. Beach, Corps of Engineers, U. S. A.

In the meantime, the dam at the head of the Bayou, authorized by the Secretary of War, pending the construction of a lock, will no doubt be permitted to remain. However, it should not be overlooked that this is, under all circumstances surrounding it, a great concession on the part of the National Government, and steps to

adjust the situation to comprehensive and permanent lines should not be delayed any longer than can possibly be helped.

The project for permanently closing Bayou Lafourche at its head, at Donaldsonville, by a lock or dam continues in favor, the benefits to the entire section of the State contiguous to Bayou Lafourche being manifold and convincing beyond the most sanguine expectations of its promoters.

Highways.

This subject, of such widespread interest to the State at large, the Board of State Engineers considered entitled to treatment in a special report, addressed to it by its Acting State Highway Engineer. This report here follows; viz:

Highway Department
Of The
Board Of State Engineers
Room 104
New Orleans Court Building.

New Orleans, La., April 20, 1912.

To the Board of State Engineers:

The closing paragraph under the caption of "Roads" in the last biennial report of the Board of State Engineers, read as follows:

"With reference to the question of public roads, the Board of State Engineers is, as with the problem of drainage, also of the opinion that the ultimate systematic and comprehensive results at large will only be attained through State organization and direction."

Act 49 of the Session of the State Legislature in 1910 furnished foundation and authority for just such State organization and direction as was suggested in the foregoing paragraph.

Under the provisions of this act, a State Highway Department was created and the enabling act, No. 14 of the same year, provided revenues for the organization and operation of the Department. Act 49 provides that the Highway Department be made a subsidiary department of the Board of State Engineers, and the duties of the Board in this respect, as defined by this act, are "Control of State-

Highways under certain conditions; to elect a State Highway Engineer; to define his powers and duties; and fix his compensation; to authorize the construction and maintenance of highways by contract or by the Highway Engineer; to provide for the working of convicts on highways under certain regulations, to authorize the acquisition, by expropriation or otherwise, of rights of way for highways, drainage canals, or ditches; to provide a revenue for carrying out the objects and purposes of this act, and to provide for the disbursement thereof; and to require the parishes, cities, towns and villages to contribute a certain proportion of the costs of constructing and maintenance of highways; defining a State Highway, and repealing all laws or parts of laws in conflict with this Act."

Act. No. 14 is in the form of a joint resolution of the House and the Senate, amending the Constitution of the State of Louisiana, and is self-executing without the necessity of an enabling act of the Legislature, and had effect from the date of its adoption. The tax it provides is considered a part of the general six mill State tax authorized to be levied by the Constitution.

The act authorized the levy and collection of one-fourth of one mill on the assessed value of all property in the State of Louisiana, for the creating of a road fund to construct and maintain public roads of the State.

Act. 49 approved June 29th, 1910, and promptly promulgated, becoming effective during the summer of 1910, but, as the road tax was not to be levied until the year 1911 and no revenues could be expected till then, it was not considered advisable to officially organize the Highway Department until the early part of 1911. Consequently, the highway work which had been inaugurated prior to the passage of Act 49, under the broad plan which His Excellency, Governor J. Y. Sanders advocated, and arranged, whereby the Federal Government, the State, and the Parishes of the State cooperated, was continued under that arrangement up to February 1st, 1911.

The following statements show the number, the location, the character, the length, and the cost of construction of the highway projects undertaken and completed under this arrangement up to February 1st, 1911:

RECAPITULATION OF ROADS CONSTRUCTED TO FEBRUARY 1ST, 1911, SHOWING LOCATION, CHARACTER, MILEAGE, COST; AVERAGE COST PER MILE IN EACH PARISH, TOTAL MILEAGE CONSTRUCTED, AND TOTAL COST.

PARISH	General Character	Mileage	COST	Average Cost Per Mile
Natchitoches	Earth	13.40	$ 8,576 55	$ 640.04
DeSoto	Sand, Clay	34.15	28,380.83	831.06
Ouachita (*)	4¼ Miles Gravelled, 13 Miles Earth	17.25	25,089.10	1,454.44
Rapides	Earth	3.57	3,273.50	916.94
E. Baton Rouge	Earth	19.19	15,965.44	831.96
Orleans	Earth	15 00	13,494.95	899.66
City of Baton Rouge	Wide Gravel	.82	5,023.08	6,125.71
Total		103.38	$99,803.45	

(*) Ouachita Parish—

Average cost 4¼ miles gravelled road $3,196.58
Average cost 13 miles earth road 884.90

	Miles	Cost	Average Cost Per Mile
Total Earth Roads Constructed	64.16	$52,814.08	$ 823.16
Total Gravelled Roads Constructed	5.07	18,608.54	3,670.32
Total Sand-Clay Roads Constructed	34.15	28,380.83	831.06
Total	103.38	$99,803.45	

Average cost per mile of all roads constructed..... $965.40

STATEMENT OF ROADS CONSTRUCTED BY CONVICT LABOR TO FEBRUARY 1st, 1911, SHOWING LOCATION, COST AND AVERAGE COST PER MILE.

Natchitoches Parish.	*Miles.*
*From the limits of the City of Natchitoches to the limits of the City of Campti	8.8
From Campti towards Black Lake	3.5
From Main Road to Hagan	0.6
From Main Road to River Front (Corley Spur)	0.5
Total Miles Completed	13.4
Total Miles Constructed	13.4
Net Cost	$8,576.55
Average Cost per Mile	$ 640.04

*A small stretch (about four miles) of the road next to the corporate limits of Natchitoches as gravelled.

De Soto Parish.	*Miles.*
From the City Limits of Mansfield to the City Limits of Grand Cane	6.25
From the City Limits of Grand Cane to Keatchie Spur	4.80
From Keatchie Spur to Gloster	2.56
From Gloster to Cypress Bayou (Parish Line)	7.78
From Main Road towards Keatchie	5.50
Roads Built in City of Grand Cane	2.00
From Main Road to Gloster (Gloster Spur)	1.19
Roads Built in City of Mansfield	.25
Greening Ferry Road	2.00
Old Pleasant Hill	1.82
Total Mileage Roads Constructed	34.15
Total net cost	$28,380.83
Total mileage constructed	34.15
Average cost per mile	$831.06

Ouachita Parish—	Miles.
Claiborne Road—West Monroe to Calhoun	14.75
Arkansas Road—From West Monroe	2.50
Total miles constructed	17.25

COST OF CONSTRUCTION.

Cost of graveling 4¼ miles of road (1¾ miles on Claiborne Road, and 2½ miles on Arkansas Road), 15 feet wide, 8 inches thick at center, 6 inches thick at sides, including all cement culverts, vitrified and concrete pipe with cement retaining walls, per mile, $3,196.58	$13,585.46
13 Miles of earth road, with heavy cuts and fills, per mile, $884.89	11,503.64
Total net cost	$25,089.10
Total net cost 17¼ miles	$25,089.10
Total net cost per mile	1,454.44

Rapides Parish—	Miles.
From the City Limits of Pineville to Encampment Grounds	3.07
From the railroad within the limits of Pineville in a southerly direction	.50
Total mileage	3.57
Total net cost	$3,273.50
Total mileage constructed	3.57
Average cost per mile	$916.94

East Baton Rouge Parish—	Miles.
From North Boulevard across Allen Street to Government street	.27
From Allen Street out Government Street, and Hope Villa Road to Hope Villa	14.03
Loop—From Judge Brunot's Place, extending around Capitol Heights to old Clay Gut Road to Laycock's Place	1.65
From City Limits of the City of Baton Rouge along Greenwell Springs Road to the Baton Rouge, Hammond & Eastern Railroad	3.24
Total mileage	19.19

Total net cost $15,965.44
Total mileage constructed 19.19
Average cost per mile $831.96

N. B.—This statement does not include roads constructed in the City Liimts of the City of Baton Rouge. See attached statement covering cost and mileage of roads constructed in the City of Baton Rouge.

Orleans Parish— Miles.

From Louisville & Nashville Railroad crossing to Michaud Station, and from Michaud Station toward Chef Menteur 15.00

Total net cost $13,494.95
Total mileage constructed 15.00
Average cost per mile $899.66

City of Baton Rouge— Miles.

From High School up North Boulevard to Allen Street .82

Total net cost $5,023.08
Total mileage constructed ..... .82
Average cost per mile $6,125.71

Surfaced with Colfax gravel 25 feet wide, 8 inches thick in center, and 6 inches thick on sides.

TABLE SHOWING THE RELATIVE CONDITIONS EXISTING IN THE SECTIONS THROUGH WHICH ROADS WERE CONSTRUCTED.

PARISH	Class of Road	Clearing and Grubbing	Excavating	Drainage	Culverts and Bridging	Cost Per Mile
Rapides	Earth	Heavy	Light	Medium	Heavy	$ 916.94
*DeSoto	Sand-Clay	Heavy	Medium	Medium	Medium	831.06
Ouachita	Earth	Very Heavy	Very Heavy	Medium	Medium	884.90
Ouachita	Gravel	Light	Medium	Heavy	Heavy	3,196.58
Natchitoches	Earth	Very Light	Light	Light	Medium	640.04
E. Baton Rouge	Earth	Light	Medium	Excessively Heavy	Heavy	831.96
City of Baton Rouge	Gravel	None	Medium	Medium	Heavy	6,125.71

(*) Considerable sand was applied to heavy clay sections, while clay was applied to many deep sandy sections.

On February 1st, 1911, the Highway Department was officially organized, and such work as was still in course of construction with State convicts, was taken over by the Highway Department. Act 49 of 1910 provided for the appointment of a Highway Engineer; but, for the sake of economy, the Board of State Engineers deferred such appointment, and, by rearranging the assignments of the members of the Board, made it possible to assign one of its members, Mr. Gervais Lombard, to act as Highway Engineer without extra compensation. Moreover, his traveling expenses are paid out of the General Engineer Fund, whereas, those of a special Highway Engineer would have had to be paid out of the scant highway fund.

The personnel of the Highway Department, as at present constituted, is as follows:

Organized February 1st, 1911, with the following officers:

F. M. KERR, Chief State Engineer and President Board of State Engineers.
GERVAIS LOMBARD, Member of the Board of State Engineers, and Acting State Highway Engineer.
C. C. SANDOZ, Secretary.
GEO. L. COOLEY, Superintendent of Construction.
C. M. KERR, Chief Draftsman and Assistant Engineer.
CHAS. CHAUCHON, Stenographer.

Engineer Assistants have been employed from time to time as the conditions required. The present force of Engineer Assistants are:

W. H. NORCKAUER,
ROGER W. RICHARDSON,
LOUIS T. GILMER,
HENRY T. RICHARDSON,
B. D. WOOD,
T. S. SHIELDS.

It was found to be necessary for these Engineer Assistants to remain in the field during the entire period of construction of the projects under their direct care. The duties of the Superintendent of Construction are to visit all road work in course of construc-

tion and see that same is being conducted economically and along approved lines. He is to attend to the details of all arrangements for moving and establishing the convict camps, and to inspect the condition of completed State Aid Roads, report their condition to the Highway Engineer, and see that all contracts or arrangements for their maintenance are enforced or forfeited.

He also attends to a number of other duties from time to time, as the exigencies of the work of the Department require, and which the Board of State Engineers, through its Acting Highway Engineer may direct.

As soon as the Highway Department had been organized, notice was sent to all of the Police Juries in the State to the effect that State Aid was available, and that applications for same would be considered in the order of their receipt. A number of applications were received, and various sums were set aside by the Highway Department, out of the Highway Fund, to meet the State's portion of the cost of the projects agreed upon. Some of the Parishes, whose applications had been favorably acted upon failed, for one reason or another, to qualify, and it became necessary for the Department to rearrange its allotments.

The Parishes and Municipalities to which Monetary State Aid have been alloted, and the amounts alloted are as follows:

Grant Parish	45,866.66	Estimated
DeSoto Parish	14,019.00	"
St. Bernard	6,318.80	"
East Carroll	10,000.00	Fixed Amt.
Iberia	17,500.00	Estimated
Franklin	6,152.50	"
Plaquemines	39,227.08	"
Total	$139,084.04	

In arriving at the apportionment of the highway fund shown above, the Board of State Engineers, gave preference to projects which were of sufficient magnitude to insure a practical demonstration of the benefits of highway improvement. In other words, a long stretch of improved road, even though unsurfaced, was considered to be more useful to the community in which it was constructed, and to be a better educational factor than a short stretch of more expensive type. In the first place, the higher class metal

surfaced roads can scarcely be afforded throughout the sparsely settled rural communities, while the improved earth roads can, and, whenever traffic justified the outlay, metal surfacing can easily be provided at any time, especially after the community has learned the true value of even improved earth roads.

The foregoing statement does not include Parishes to which State Aid in another, though just as substantial form as the monetary form of aid, has been rendered. Namely:

RAPIDES	NATCHITOCHES
DESOTO	EAST BATON ROUGE
OUACHITA	ORLEANS

Not to mention several municipalities through which work was done to connect up Parish highways.

This form of State Aid is, in fact, a continuation of the plan already mentioned as having been advocated by Governor Sanders, except that the Federal Government no longer co-operates to the extent of lending the services of an experienced Superintendent of Construction and several Junior Highway Engineers. The State of Louisiana, through its Highway Department, assumed entire control of the Engineering features and supervision of construction, while, through its Board of Control of the State Penitentiary, it furnishes convicts for all the labor necessary. No charge is made for the services of either the Highway Department or the convict forces. The Parish thus aided by the State is required, however, to furnish an outfit of mules, machinery, tools and equipment; and to pay all the expenses of guarding, transporting, feeding, working and caring for the men and outfit; also to supply all bridge, culvert and other road material utilized. Improved earth roads constructed under this form of State Aid are found to cost the Parishes employing it, practically the same per mile of road constructed, as similar work let out by contract, and where the State pays half the cost.

DeSoto Parish received both forms of State Aid at the same time, for a while. That is, they maintained a camp of State Convicts, prior to and during the entire period covered by this biennial report, and also let out a contract jointly with the State for the construction of about nineteen miles of road which is now in course of construction. (See statement Page 51.)

Only very recently a camp of State convicts has been started in

St. John the Baptist Parish, where they are now at work on the road on the East or right bank of the Mississippi River.

The last biennial report mentioned a number of projects surveyed for, under way, or completed by such convict forces, but did not give exact mileage or cost data. It is therefore necessary in the following table, to include all the work so done, even that completed prior to April 21st, 1910:

STATEMENT SHOWING MILEAGE OF GOOD ROADS CONSTRUCTED WITH CONVICT LABOR, COST OF SAME AND COST PER MILE, FROM APRIL 20, 1908, TO APRIL 20, 1912.

PARISH	General Character	Mileage	Cost	Average Cost Per Mile
*Natchitoches	Earth	37.23	$29,021.01	$ 779.51
†DeSoto	Sand-Clay	50.39	43,797.59	869.17
‡Ouachita	4¼ Miles Gravelled, 13 Miles Earth	17.25	25,089.10	1,454.44
Rapides	Earth	3.57	3,273.50	916.94
‖East Baton Rouge	Earth	22.22	23,400.53	1,053.13
Orleans	Earth	15.50	16,110.11	1,039.36
City of Baton Rouge	Wide Gravelled	.82	5,023.08	6,125.71
St. John the Baptist	Earth	.50	450.00	900.00
Total		147.48	$146,164.92	

*3 Miles sand-clay.

†5 Miles natural gravel.

‡ ‡Average cost 4¼ miles gravelled road, $3,196.58.
‡Average cost 13 miles earth road, $884.90.

‖This item includes the cost of 1.1 miles of drainage canal, costing approximately $3,092.70.

	Miles	Cost	Average Cost Per Mile
Total Earth Roads Constructed	92.02	$83,758.79	$ 910.22
Total Sand-Clay Roads Constructed	50.39	43,797.59	869.17
Total Gravelled Reads Constructed	5.07	18,608.54	3,770.32
Total	147.48	$146,164.92	

Average cost per mile of all roads constructed $991.08

The Highways undertaken with Monetary State Aid between April 21st, 1910, and April 21st, 1912, are as follows:

CONTRACTS LET BY THE HIGHWAY DEPARTMENT OF THE BOARD OF STATE ENGINEERS FROM APRIL 21, 1910, TO APRIL 20, 1912.

Date of Contract.	PARISH.	NAME OF ROAD.	Character.	Distance in Miles.	Amount.	Portion Completed April 20, 1912.	REMARKS.
May 22, 1911	Grant	Colfax-Rochelle	Earth	30.10	$56,920.00	13.00	
June 20, 1911	De Soto	Mansfield-Logansport	Earth	20.00	28,038.00	9.00	
Aug. 14, 1911	Plaquemines	Pointe-a-la-Hache Highway	Shell	33.00	119,681.25	None	Construction to begin about May 1, 1912.
Sept. 25, 1911	Grant	Pollock Branch	Earth	12.87	24,665.30	12.87	
Sept. 23, 1911	St. Bernard	Toca Settlement Highway	Shell	3.00	12,167.50	1.50	
Oct. 23, 1911	East Carroll	State Line to Madison Parish Line	Earth	38.00	24,925.00	21.00	
Nov. 6, 1911	Franklin	Winnsboro Highways	Earth	12.00	12,305.00	None	Construction to begin about May 1, 1912.
March 26, 1912	Iberia	New Iberia to Jeanerette	Petrolithic Macadam Liquid Asphalt Binder	9.50	52,413.00	None	Construction to begin about May 1, 1912.
	Total			158.55	$331,115.05	57.37	

The foregoing statements do not include the New Basin Canal and Shell Road Causeway, which was constructed and paid for in its entirety by a State institution, the Board of Commissioners New Basin Canal and Shell Road.

This causeway was, up to three years ago, a toll-road, operated by the State. It was surfaced with shells and for many years was considered one of the fastest driveways in existence. However, this road proved to be too low for uninterrupted traffic, often being submerged by storm tides in Lake Pontchartrain. For this reason Governor Sanders induced the Orleans Levee Board to elevate the road bed to serve as a part of the protection levee, and the Canal Board then remodeled and rebuilt the road, making of it one of the finest shelled causeways in the world. It is now well above storm tide, is 3½ miles long, is paved 40 feet wide, and is as smooth and level as it was possible to construct it. It cost approximately $78,000.00, and is being maintained in almost perfect condition.

A feature of the Highway Department's duties, which the Board of State Engineers had at first hoped could be more economically assumed by the communities to which State Aid had been rendered, was the maintenance of completed improved highways; but our experience has shown that the local authorities cannot, except in rare cases, be depended upon. The Highway Department has therefore been forced to budget for the future, a somewhat larger proportion of its funds for this purpose than in the past.

For the lack of simple dragging with a King split log drag, or similar device manufactured of steel, many miles of the improved earth roads constructed with State Aid have suffered severely. A system of inspection and maintenance is now being devised, whereby the Highway Department will attend directly to letting the contracts for and supervising the work of dragging and otherwise maintaining these highways.

The rapid increase in the number of automobiles and motor driven vehicles throughout the State has introduced new problems which it will be necessary for the Highway Department to meet. Besides the confusion brought about by various licensing and numbering systems, independently imposed by the several municipalities in the State, and which makes it very difficult to identify the

swiftly moving motor cars, these heavy and powerful machines exert tremendous force suddenly on comparatively small areas, ravel all classes of road, and stir the dust so seriously as to cause injury and rapid deterioration of the surface of the roads. The need of some uniform and centralized regulation has been recognized throughout the United States and many of the States have enacted State wide regulation. The subject is one which should receive serious consideration in Louisiana.

Respectfully submitted,

HIGHWAY DEPARTMENT
OF THE
BOARD OF STATE ENGINEERS.
GERVAIS LOMBARD,
Assistant State Engineer, and Acting State Highway Engineer.

C. C. SANDOZ, *Secretary.*

DRAINAGE AND RECLAMATION.

The statutes of 1910 practically supplanted all previous legislation on the subject of drainage and reclamation in Louisiana.

Act No. 197 of the General Assembly of the State, passed at the session in 1910, proposing an Amendment to Article 281 of the Constitution of Louisiana of 1898, was adopted and embodied as part of the organic law by the electors of the State at the General Election held on November 10th, 1910. Act No. 256 of the same session, provided the mode of holding special elections for special taxes and forced contributions, and for the issuance of bonds thereunder, and Act. No. 317 prescribed the manner and mode of organizing and administering the affairs of drainage districts generally.

Act 317, Section 21, recites "In determining the costs of the drainage, it shall be the duty of the Board of State Engineers, when called upon, to make all surveys and examinations necessary to determine such cost, and to run all lines and levels, lay off canals and levees, locate all pumping stations, and perform any and all other services in connection with the drianage and reclamation of the lands of any district that may be required by the Commissioners of said district. The Drainage District shall pay the expenses incurred by the Board of State Engineers in making such surveys."

Under this Act, the Board of State Engineers has been called upon for surveys and the engineering advice necessary, by the following named drainage districts:

Thornwell Drainage District No. 1, Calcasieu Parish.
Avoyelles Drainage District No. 1, Avoyelles Parish.
Eighth Ward No. 1 Drainage District, Lafayette Parish.
Avoca Drainage District of St. Mary Parish.
Bayou Terre aux Boeufs Drainage District and Sub-Drainage District "A," "C" and "D," of Plaquemines Parish.
New River Drainage District of Ascension Parish.
Bayou Sale Drainage District of St. Mary Parish.
Sixth Ward and Crowley Drianage District of Acadia Parish.
St. Charles Municipal Drainage District, and Sub-Drainage Districts Nos. 1, 2, 3, 4 and 5, of St. Charles Parish.
Franklin Drainage District of St. Mary Parish.
English Turn Drainage District of Plaquemines Parish.
Gueydan Sub-Drainage District No. 1 of Vermillion Parish.
Fourth Ward Drainage District of Lafayette Parish.
Bayou Queue de Tortue Drainage District of Acadia Parish.
Belle Chasse Drainage District of Plaquemines Parish.
Brookston Drainage District of East Baton Rouge Parish.
Drainage District No. 2 of Madison Parish.
Pontchartrain Sub-Drainage District No. 1 of St. Charles Parish.
Vinton Drainage District of Calcasieu Parish.
Keystone Drainage District of Calcasieu Parish.
Upper Terrebonne Drainage District of Terrebonne Parish.
Cameron Drainage District of Cameron Parish.
Kinder Drainage District of Calcasieu Parish.

Of these, the Board of State Enginers has already reported upon the practicability, feasibility and cost of the following, viz:

Thornwell Drainage District No. 1 of Calcasieu Parish.
Avoyelles Drainage District No. 1 of Avoyelles Parish.
Eighth Ward No. 1 Drainage District of Lafayette Parish.
Avoca Drainage District of St. Mary Parish.
Bayou Terre aux Boeuf and Sub-Drainage Districts "A," "C" and "D" of Plaquemines Parish.
New River Drainage District of Ascension Parish.
Bayou Sale Drainage District of St. Mary Parish.

Sixth Ward and Crowley Drainage District of Acadia Parish.

St. Charles Municipal Drainage District and Sub-Drainage Districts Nos. 1 and 2 of St. Charles Parish.

English Turn Drainage District of Plaquemines Parish.

Gueydan Sub-Drainage No. 1 District of Vermillion Parish.

Fourth Ward Drainage District of Lafayette Parish.

Pontchartrain Sub-Drainage District No. 1 of St. Charles Parish.

Drainage District No. 2 of Madison Parish.

Belle Chasse Drainage District of Plaquemines Parish.

The extent and diversity of the productiveness of the wet lands of Louisiana, when properly drained and reclaimed is, daily, becoming so generally and favorably recognized that the formation of New drainage districts is following at a very rapid rate, and the efforts of the Board of State Engineers to keep pace with the demands for surveys and services in connection therewith will, in conjunction with the numerous other duties required of it in other directions, be, thereby, more and more severely tested.

New Basin Canal And Shell Road.

The Board of Control of the New Basin Canal and Shell Road has, during the past two years, as during similar periods, called upon the Board of State Engineers, on a number of occasions, for engineering advice and duties.

This involved lines, levels and specifications in connection with the establishment of the boundaries of its property, dredging of channels, maintenance of highways and revetments, and checking up elevations of pipes and conduits for the flow of water, gas, electricity, etc., permitted by the Board to be, under certain conditions and stipulations, extended across the canal.

The crowning work of the Board of Control of the New Basin Canal and Shell Road, however, during the past two years, outside of the generally accepted admirable conduct of the affairs of the Board, of which a report will be, as usual, submitted by the Board itself, was the completion, under the plans and specifications of the Board of State Engineers, of the shell road on the West bank of the Canal, from Metairie Cemetery to West End, and its maintenance in such excellent condition since.

The Board of State Engineers, in its last bi-ennial report said, "There is little reason to doubt that this roadway, when completed, which will be within the course of the next thirty days or so, will rank in durability, service and elegance with most of the very best in the country at large."

This forecast has been verified in all particulars.

Stages Of The Rivers.

From the following table, showing the highest water of previous record, as well as the stages attained in 1910, 1911, and 1912, up to April 20th, 1912, or the date of this report, at stations mostly governing high water conditions affecting Louisiana, it will be seen that in 1910 and 1911, no stages were anywhere reached approximating by material margins the highest recorded flood stages of the past.

However, this year, up to the time of closing this report, new records for high water, at a number of stations in the Valley affecting Louisiana, have already been established, and it would appear probable that before the close of the high water period of the year, the highest stages of the river in the past at other stations may also be exceeded.

With reference to the high water of 1912, up to the date of this report, it is difficult to forecast the outcome. Suffice it, for the time being, to say that it would appear, in the absence of the actual gagings of the river at controlling stations, that as large a volume as, if not a larger volume of water than any in the history of the past is at this time passing down the Mississippi River.

This is largely due to the fact that conditions, this season, developed, which, in the past, were accepted as possible but not probable, namely, climatic influences permitting continued widespread and severe precipitation, and the melting of snow and ice, at about one and the same time, in the several larger tributaries to the Valley, instead of from one or at most two, as is usual to that period of the year during which the Mississippi River is called upon to carry and care for Spring floods.

Again, more basins in the Valley had been leveed than ever before, imposing upon the other levee systems upon which it has been dependent for protection unusual additional service and strain.

Thus, it is with regret that it must be recorded that a number of serious breaches have already occurred in the lines of levee in Arkansas, Mississippi and Louisiana.

Those, however, most immediately affecting Louisiana are so far limited to four, namely, the crevasse at Panther Forest, about 16 miles below Arkansas City, in Chicot County, Arkansas; at Salem, about 19 miles below Lake Providence, East Carroll Parish, Louisiana,—both on the West bank of the Mississippi River; near Atkins Bayou, about 4:5 miles below West Melville, St. Landry Parish, on the West bank of the Atchafalaya River, and at a point about 10 miles below East Melville, on the East bank of the Atchafalaya River.

Neither the exact causes of these breaks, nor the full extent of the damages that may result can at this early date be stated.

However, it may, without fear of justified contradiction, be asserted that, in spite of these four evidences of weakness in the lines of levees upon which our State is relying for protection from overflow, the system as a whole has generally proven a monument of effectiveness, and should continue to inspire the utmost confidence in the possibility of its ultimate perfection and triumph under and over all conditions.

This calls only for higher grades, here and there, more ample cross-section, most everywhere, special treatment of base in certain localities where unstable sub-strata are known to prevail, and thorough, systematic comprehensive organization at all times for preservation and maintenance:

LOCALITY.	Highest Water of Previous Record.		High Water 1910.		High Water 1911.		High Water, 1912, to April 20, 1912.	
	Gage Reading.	Year.	Gage Reading.	Below Highest Water.	Gage Reading.	Below Highest Water.	Reading.	Above or Below Highest Water.
MISSISSIPPI RIVER—								
Memphis, Tenn.	40.30	1907	33.12	7.18	36.50	3.80	44.90	+ 4.60
Arkansas City, Ark.	52.90	1903	43.13	9.77	48.00	4.90	55.40	+ 2.50
Greenville, Miss.	49.10	1903	36.95	12.15	41.60	7.50	50.50	+ 1.40
Lake Providence, La.	46.48	1903	36.90	9.58	41.50	4.98	48.25	+ 1.77
Vicksburg, Miss.	52.48	1897	40.60	11.88	45.10	7.38	51.90	— 0.58
St. Joseph, La.	48.07	1903	36.30	11.77	41.20	6.87	48.60	+ 0.53
Natchez, Miss.	50.35	1903	39.80	10.55	44.30	6.05	51.40	+ 1.05
Red River Landing, La.	50.20	1897	38.50	11.70	42.70	7.50	50.10	— 0.10
Baton Rouge, La.	40.65	1897	29.50	11.15	32.50	8.15	40.50	— 0.15
Donaldsonville, La.	32.75	1897	23.00	9.75	25.40	7.35	32.20	— 0.55
Carrollton, La.	19.42	1903	12.85	6.57	14.60	4.82	19.15	— 0.27
New Orleans, La.	20.30	1903	14.40	5.90	16.00	4.30	20.40	+ 0.10
Fort Jackson, La.	8.30	1907	6.25	2.05	7.00	1.30	8.10	— 0.20
RED RIVER—								
Fulton, Ark.	35.75	1876	22.53	13.22	24.10	11.65	30.90	— 4.85
Shreveport, La.	35.70	1892	13.86	21.84	13.50	22.20	19.30	—16.40
Alexandria, La.	41.80	1908	22.38	19.42	25.10	16.70	33.50	— 8.30
ATCHAFALAYA RIVER—								
Barbres Landing	50.95	1897	35.37	15.58	40.20	10.75	49.25	— 1.70
Melville, La.	39.70	1908	32.14	7.56	36.70	3.00	40.50	+ 0.80

+ Above highest water of previous record.

— Below highest water of previous record.

APPENDICES.

Tabular statements showing details of the levee work of the past two years, and important statements of high water records will be found in the appendices following this report.

Appendix "A". Tabular statements relative to location, length, quality and cost of levee work undertaken by the State of Louisiana, the several levee districts of the State, and the United States, in Louisiana, and a part of Arkansas, from April 20th, 1910, to April 20th, 1912.

Appendix "B". Tabular statements relative to high water records.

It is with sorrow that the Board of State Engineers is called upon to record the death, on February 13th, 1912, of one of its time-honored and most faithful and loyal employees, R. J. Smith, Rodman. He entered the service of the department as a boy in 1880, thus devoting, in an humble but most useful way, his best energies to its interests for the unusual period of thirty-two years.

In conclusion, the Board of State Engineers wishes to express its high appreciation of the efficient and valuable services rendered by its corps of employees, namely: G. W. Lawes, Secretary; A. C. Duval, Chief Draftsman; Walter P. Villere, Assistant Draftsman; F. W. Schluter, Assistant Secretary, Stenographer and Typewriter; J. R. Adams, J. F. Villavaso, F. B. Grevemberg, Jr., and E. S. Bres, Levelers.

Respectfully submitted,

THE BOARD OF STATE ENGINEERS.
FRANK M. KERR,
Chief State Engineer.
GERVAIS LOMBARD,
WALTER H. HOFFMAN,
J. W. MONGET,
H. C. SMITH,
Assistant State Engineers.

G. W. LAWES, *Secretary.*

APPENDIX A.

TABULAR STATEMENTS RELATIVE TO LOCATION, LENGTH, QUANTITY AND COST OF LEVEE WORK, DRAINAGE, REVETMENT, ETC., UNDERTAKEN BY THE STATE OF LOUISIANA, THE SEVERAL BOARDS OF LEVEE COMMISSIONERS, AND THE UNITED STATES, IN LOUISIANA AND A PART OF ARKANSAS, FROM APRIL 20, 1910, TO APRIL 20, 1912.

NOTE: The number of cubic yards given in the following statements for work done by the levee districts is based upon the list of dimensions furnished and estimates made by the Board of State Engineers for the levees named, and the cost is obtained by applying the price per cubic yard bid for the work, without regard to discount, interest or other incidental expenses incurred by the Levee Commissioners.

Levee work undertaken by the State of Louisiana, in the several Levee Districts, under fifty-two contracts entered into from April 20, 1910, to April 20, 1912, with seven contracts of earlier date, not completed April 20, 1910.

Number	Name of Contract.	Parish.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Cost.	Price—Cents.	Stream.	REMARKS.
	FIFTH LOUISIANA LEVEE DISTRICT.										
1	Willow Point to Henderson	East Carroll	Aug. 24, 1910	Feb. 17, 1912	.....	9,050	45,001	$7,065.16	15.70	Mississippi Riv.	
2	Omega	Madison	Aug. 24, 1910	May 1, 1911	.....	9,100	100,911	16,377.86	16.23	Mississippi Riv.	
3	Delta to Martin	Madison	Aug. 21, 1911	.....	.....	5,714	144,270	25,521.36	17.69	Mississippi Riv.	
4	Martin	Madison	Aug. 21, 1911	.....	.....	7,006	65,043	19,506.40	29.89	Mississippi Riv.	
5	Hodges	Madison	Aug. 21, 1911	.....	.....	8,200	53,691	12,563.69	23.40	Mississippi Riv.	
6	Diamond Island	Madison	Aug. 21, 1911	.....	.....	9,320	75,000	21,000.00	28.00	Mississippi Riv.	
7	Panola	Tensas	Aug. 24, 1910	April 10, 1911	.....	13,707	89,128	12,469.00	13.99	Mississippi Riv.	
8	Ingefield	Tensas	Jan. 3, 1910	.....	6,287	.....	315,000	63,000.00	20.00	Mississippi Riv.	
9	Kempe	Tensas	Sept. 4, 1911	.....	.....	5,779	61,677	19,428.25	31½	Mississippi Riv.	
10	Sycamore	Concordia	Oct. 29, 1909	June 13, 1910	2,994	.....	53,153	8,212.14	15.45	Mississippi Riv.	
11	Upper Green	Concordia	Oct. 28, 1909	Aug. 15, 1910	7,505	.....	293,303	65,677.47	22.40	Mississippi Riv.	
12	Lower Green	Concordia	Jan. 3, 1910	July 27, 1910	4,075	.....	160,222	40,055.50	25.00	Mississippi Riv.	
13	Fairview	Concordia	Jan. 25, 1911	July 19, 1911	6,239	.....	173,448	29,486.16	17.00	Mississippi Riv.	
	Totals				27,100	67,876	1,629,847	$340,362.99	.....		
	Less work done previous to Apr. 20, '10, and not comp'd Apr. 20, '12.				8,481	14,153	752,599	120,523.92	.....		
	Work done from April 20, 1910, to April 20, 1912				18,619 or 3.52 miles.	53,723 or10.17 miles.	877,248	$219,839.07	.....	.....	{ Aver. price per cu. yd., 25.06 cts.

ATCHAFALAYA BASIN LEVEE DISTRICT.

14	Smithland	Pointe Coupee	Aug.	17, 1910		4,208	.....	142,263	$25,607.34	18.00	Mississippi Riv.	
	Red River Landing Section					1,985	.....	66,875	12,037.50	18.00	Mississippi Riv.	
	Torras Section					.....	8,790	45,000	8,100.00	18.00	Mississippi Riv.	
15	Philadelphia Point	Ascension	May	8, 1911	Oct. 4, 1911	3,178	.....	89,326	13,398.90	15.00	Mississippi Riv.	
16	Hudson	Pointe Coupee	Feb.	12, 1912		3,843	.....	135,000	29,700.00	22.00	Atchafalaya R.	
	Totals					13,214	8,790	478,464	$88,843.74	.....		
	Less work not completed previous to April 20, 1912					3,520	3,084	139,053	30,042.74	.....		
	Work done from April 20, 1910, to April 20, 1912					9,694 or 1.84 miles.	5,706 or 1.08 miles.	339,411	$58,801.00	.....	.....	Aver. price per cu. yd., 17.32 cts.

PONTCHARTRAIN LEVEE DISTRICT.

17	Baton Rouge to Arlington	E. Baton Rouge	Sept.	15, 1911	Mar. 22, 1912	.....	10,810	124,004	$19,468.63	15.70	Mississippi Riv.	
18	Billings	Iberville	Sept.	15, 1910	Jan. 11, 1911	.....	3,365	34,748	5,639.60	16.23	Mississippi Riv.	
19	Ophelia	Iberville	Sept.	15, 1910	Mar. 2, 1911	.....	4,830	42,745	5,766.30	13.49	Mississippi Riv.	
20	Gypsy	St. Charles	Sept.	30, 1909	June 24, 1910	1,890	.....	50,342	8,004.38	15.90	Mississippi Riv.	
21	Deckbar	Jefferson	Sept.	15, 1910	Nov. 14, 1910	1,060	.....	35,395	8,133.77	22.98	Mississippi Riv.	
	Work done from April 20, 1910, to April 20, 1912					2,950 or 0.56 miles.	19,005 or 3.60 miles.	287,234	$47,012.68	.....	.....	Aver. price per cu. yd., 16.37 cts.

Number	Name of Contract.	Parish.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Cost.	Price—Cents.	Stream.	REMARKS.
	LAFOURCHE LEVEE DISTRICT.										
22	Sims	Ascension	Oct. 28, 1909	Nov. 11, 1910	1,455	.....	7,258	$1,807.22	24.90	Mississippi Riv.	
23	Point Houmas	Ascension	Sept. 15, 1910	May 2, 1911	2,714	4,315	134,608	20,702.71	15.38	Mississippi Riv.	
24	Schexinaydre	St. Charles	Oct. 20, 1910	Dec. 15, 1910	725	.....	15,708	3,036.88	19⅓	Mississippi Riv.	
25	Parish Line to Belle Chasse	Plaquemines	Aug. 21, 1911	.....	4,565	21,770	200,000	42,400.00	20.70	Mississippi Riv.	
	Totals				9,459	26,085	357,574	$67,946.81	.....		
	Less work not completed April 20, 1912				1,250	13,095	93,216	19,295.71	.....		
	Work done from April 20, 1910, to April 20, 1912				8,209 or 1.56 miles.	12,990 or 2.46 miles.	264,358	$48,651.10	.....	.....	Aver. price per cu. yd., 18.40 cts.
	LAKE BORGNE BASIN LEVEE DISTRICT.										
26	Scarsdale	Plaquemines	Sept. 15, 1910	Mar. 13, 1911	1,285	.....	25,719	$5,514.20	21.90	Mississippi Riv.	See Dist. Contract.
	Martin Section	Plaquemines			2,279	.....	31,189	6,948.65	21.90	Mississippi Riv.	See Dist. Contract.
27	Bertrandville	Plaquemines	Sept. 15, 1910	Jan. 17, 1911	823	.....	11,273	1,679.68	14.90	Mississippi Riv.	
28	Linwood	Plaquemines	Oct. 10, 1911	.....	2,893	.....	59,585	11,142.39	18.70	Mississippi Riv.	
29	Monsecour	Plaquemines	Sept. 19, 1910	Dec. 1, 1910	931	.....	18,262	3,287.16	18.00	Mississippi Riv.	
30	E. Duplesis	Plaquemines	Sept. 20, 1909	Oct. 6, 1910	1,765	.....	18,273	2,722.68	14.90	Mississippi Riv.	
31	Arnold Cosse	Plaquemines	Nov. 27, 1909	Oct. 28, 1910	1,605	.....	20,972	3,670.10	17.50	Mississippi Riv.	
	Totals				11,581	.....	185,273	$34,964.86	.....		
	Less work done previous to Apr. 20, '10, and not comp'd Apr. 20, '12.				3,640	.....	55,134	9,656.97	.....		
	Work done from April 20, 1910, to April 20, 1912				7,941 or 1.51 miles.	.....	130,139	$25,307.89	.....	.....	Aver. price per cu. yd., 19.45 cts.

BURAS LEVEE DISTRICT.

32	Orange Farm	Plaquemines	Oct. 7, 1910	Dec. 24, 1910	1,865	.....	17,086	$3,456.49	20.23	Mississippi Riv.		
33	Doullut Canal	Plaquemines	Oct. 10, 1911	Jan. 17, 1912	.....	1,850	2,120	2,898.06	19¼	Mississippi Riv.	Inc.	$2,491.06 for rev.
34	Stockfleth	Plaquemines	Sept. 11, 1911	Mar. 21, 1912	650	548	5,142	3,061.70	24.98	Mississippi Riv.	Inc.	$1,640.20 for rev.
35	Clinton to Moizant	Plaquemines	Sept. 14, 1911	Jan. 2, 1912	2,710	.....	3,578	4,901.34	24¼	Mississippi Riv.	Inc.	$4,033.68 for rev.
36	Moizant	Plaquemines	Sept. 11, 1911	Jan. 17, 1912	1,115	.....	7,933	3,809.74	27.73	Mississippi Riv.	Inc.	$1,609.92 for rev.
37	Cognovitch	Plaquemines	Sept. 11, 1911	Nov. 17, 1912	350	.....	2,694	1,005.36	19.00	Mississippi Riv.	Inc.	$493.50 for rev.
38	Pelas to Buras Church	Plaquemines	Oct. 7, 1910	Feb. 2, 1911	1,608	.....	14,433	5,824.33	25.48	Mississippi Riv.	Inc.	$2,146.80 for rev.
	Work done from April 20, 1910, to April 20, 1912				8,298 or 1.57 miles.	2,398 or 0.46 miles.	52,986	$24,957.02	.....	.....	{ Aver. price per cu. yd., 23.67 cts.	

GRAND PRAIRIE LEVEE DISTRICT.

39	Fox	Plaquemines	Oct. 4, 1909	Dec. 23, 1910	2,090	840	30,700	$4,294.43	13.99	Mississippi Riv.		
40	Church	Plaquemines	Sept. 15, 1910	Dec. 29, 1910	715	1,270	16,373	2,495.24	15.24	Mississippi Riv.		
41	Church to Pinaud	Plaquemines	Aug. 21, 1911	Feb. 1, 1912	903	5,685	32,348	11,057.22	17.86	Mississippi Riv.	Inc.	$5,283.10 for r
42	Church to Pinaud Revetment	Plaquemines	Dec. 14, 1911	Feb. 12, 1912	.....	.....	.....	981.54	.....	Mississippi Riv.	Revetment.	
43	Waltzer	Plaquemines	Aug. 21, 1911	Feb. 8, 1912	2,305	.....	22,696	3,154.74	13.90	Mississippi Riv.		
44	Nestor to Burton	Plaquemines	Sept. 15, 1910	Dec. 1, 1910	145	2,572	7,742	5,092.40	18.75	Mississippi Riv.	Inc.	$3,640.78 for r
45	Point Pleasant Revetment	Plaquemines	Aug. 21, 1911	Nov. 28, 1911	.....	.....	.....	6,349.26	.....	Mississippi Riv.	Revetment.	
	Totals				6,158	10,367	109,859	$33,424.83	.....			
	Less work done previous to April 20, 1910				2,200	.....	23,023	3,220.92	.....			
	Work done from April 20, 1910, to April 20, 1912				3,958 or 0.75 miles.	10,367 or 1.96 miles.	86,836	$30,203.91	.....	.....	{ Aver. price per cu. yd., 15.63 cts.	

Number	Name of Contract.	Parish.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Cost.	Price—Cents.	Stream.	REMARKS.
			PLAQUEMINES PARISH EAST BANK LEVEE DISTRICT.								
46	Restoration of Gulf Coast	Plaquemines	April 29, 1910		.....	117,700	200,000	$40,000.00	20.00	Gulf Coast.	
46A	Cusclich Side	Plaquemines	March 30, 1911		1,640	.....	6,253	1,344.39	21½	Gulf Coast.	
	Totals				1,640	117,700	206,253	$41,344.39	.....		
	Less work not completed April 20, 1912				1,325	.....	5,050	1,085.75	.....		
	Work done from April 20, 1910, to April 20, 1912				315 or 0.06 miles.	117,700 or 22.30 miles.	201,203	$40,258.64	.....		Aver. price per cu. yd., 20 cts.
			BOSSIER LEVEE DISTRICT.								
47	Jeter	Bossier	June 15, 1911	Sept. 22, 1911	3,760	.....	49,364	$6,165.56	12.49	Red River.	
	Work done from April 20, 1910, to April 20, 1912				3,760 or 0.71 miles.	.....	49,364	$6,165.56	.....		
			BOSSIER SUB-LEVEE DISTRICT.								
48	Carolina	Bossier	Sept. 4, 1911		5,803	2,680	98,957	$12,765.45	12.90	Red River.	
	Totals				5,803	2,680	98,957	$12,765.45	.....		
	Less work not completed April 20, 1912				3,820	.....	26,848	3,463.39	.....		
	Work done from April 20, 1910, to April 20, 1912				1,983 or 0.37 miles.	2,680 or 0.51 miles.	72,109	$9,302.06	.....		

RED RIVER SUB-LEVEE DISTRICT.

49	South Bank of Loggy Bayou	Red River	June	15, 1911	Jan.	18, 1912	4,630	.....	35,581	$8,005.72	22.50	Loggy Bayou.	
	Work done from April 20, 1910, to April 20, 1912						4,630 or 0.97 miles.	.....	35,581	$8,005.72	.....		

RED RIVER, ATCHAFALAYA AND BAYOU BOEUF LEVEE DISTRICT.

50	Alexandria Westward	Rapides	Feb.	8, 1911	Aug.	26, 1911	35,959	.....	135,886	$19,476.99	14½	Bayou Rapides	
51	Hatch	Rapides	Feb.	10, 1911	May	1, 1911	1,967	.....	12,658	1,737.94	13.73	Red River.	
52	Melville to Latanier (480—610+58=600).	St. Landry	May	16, 1910	Feb.	13, 1911	.....	13,058	46,689	14,006.70	30.00	Atchafalaya R.	
53	Latanier South (690-805)	St. Landry	Oct.	3, 1910			11,500	.....	264,117	58,105.74	22.00	Atchafalaya R.	
	Totals						49,426	13,058	459,350	$93,327.37	.....		
	Less work not completed April 20, 1912						2,460	.....	56,500	12,430.00	.....		
	Work done from April 20, 1910, to April 20, 1912						46,966 or 8.99 miles.	13,058 or 2.47 miles.	402,850	$80,897.37	.....	.....	Aver. price per cu. yd., 20.08 cts.

Number	Name of Contract.	Parish.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Cost.	Price—Cents.	Stream.	REMARKS.
			NATCHITOCHES SUB-LEVEE DISTRICT.								
54	Grand Bend	Rapides	Oct. 7, 1910	Dec. 26, 1910	2,952	.....	12,521	$1,502.52	12.00	Red River.	
55	Cut-Off Bayou	Rapides	Mar. 28, 1912	.....	3,328	.....	63,000	9,418.50	14.95	Red River.	
56	Wilson	Rapides	Mar. 28, 1912	.....	1,800	.....	48,000	8,030.40	16.73	Red River.	
	Totals				8,080	.....	123,521	$18,951.42	.....		
	Less work not completed April 20, 1912				5,128	.....	111,000	17,448.90	.....		
	Work done from April 20, 1910, to April 20, 1912				2,952 or 0.56 miles.	.....	12,521	$1,502.52	.....	.....	Aver. price per cu. yd., 12 cts.
			SALINE LEVEE AND DRAINAGE DISTRICT.								
57	Cassandria to Experiment Plantation	Avoyelles	Oct. 7, 1910	Mar. 28, 1911	.....	9,239	41,069	$5,749.66	14.00	Red River.	
58	Experiment Plantation South	Avoyelles	Sept. 25, 1911		.....	9,600	65,172	9,775.80	15.00	Red River.	
	Totals				.....	18,839	106,241	$15,525.46	.....		
	Less work not completed April 20, 1912				.....	382	25,956	3,893.40	.....		
	Work done from April 20, 1910, to April 20, 1912				.....	18,457 or 3.50 miles.	80,285	$11,632.06	.....	.....	Aver. price per cu. yd., 14.49 cts.

RECAPITULATION OF WORK DONE FROM APRIL 20, 1910, TO APRIL 20, 1912, AS SHOWN IN THE FOREGOING.

DISTRICT.	Miles of		Cubic Yards.	Cost.
	New Levee.	Enlargement.		
Fifth Louisiana	3.52	10.17	877,248	$219,839.07
Atchafalaya Basin	1.84	1.08	339,411	58,801.00
Pontchartrain	0.56	3.60	287,234	47,012.68
Lafourche	1.56	2.46	264,358	48,651,10
Lake Borgne Basin	1.51	....	130,139	25,307.89
Buras	1.57	0.46	52,986	24,957.02
Grand Prairie	0.75	1.96	86,836	30,203.91
Plaquemines Parish East Bank	0.06	22.30	201,203	40,258.64
Bossier	0.71	....	49,364	6,165.56
Bossier Sub	0.37	0.51	72,109	9,302.06
Red River Parish Sub	0.87	....	35,581	8,005.72
Red River, Atchafalaya and Bayou Boeuf	8.99	2.47	402,850	80,897.37
Natchitoches Sub	0.56	....	12,521	1,502.52
Saline Levee and Drainage	3.50	....	80,285	11,632.06
Totals	26.37	45.01	2,892,125	$612,536.60

Levee work undertaken by the Board of Commissioners of the Tensas Basin Levee District, under four contracts entered into from April 20, 1910, to April 20, 1912, with five contracts of earlier date not completed April 20, 1910.

Number	Name of Contract.	Parish.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Cost.	Price—Cents.	Stream.	REMARKS.
1	Upper Lucca	Desha Co., Ark.	Sept. 4, 1911	Feb. 17, 1912	.....	7,534	48,936	$11,499.96	23½	Mississippi Riv.	
2	Lucca	Desha Co., Ark.	Mar. 30, 1911	Feb. 17, 1912	7,018	.....	347,493	72,348.04	20.82	Mississippi Riv.	
3	Lower Lucca	Desha Co., Ark.	Sept. 4, 1911	.....	.....	3,831	49,074	10,796.28	22.00	Mississippi Riv.	
4	Chicot Front 650–699 Drain Ditch	D'ha Co., Ark.	Sept. 19, 1906	June 27, 1910	4,500	.....	364,124	87,389.76	24.00	Mississippi Riv.	
			.....	.....	.....	.....	30,525	5,494.50	18.00	Mississippi Riv.	
5	Chicot Front Enlargement	Desha Co., Ark.	Sept. 27, 1910	Jan. 24, 1911	.....	930	11,870	4,688.65	39½	Mississippi Riv.	
6	Fulton Lake Enlargement	Desha Co., Ark.	Feb. 10, 1909	Mar. 1, 1911	.....	22,070	293,402	78,925.14	26.90	Mississippi Riv.	
7	Boeuf River Cut-Off No. 1	Morehouse and Richland	Sept. 15, 1909	Oct. 11, 1910	3,70	.....	7,170	1,577.40	22.00	Boeuf River.	
8	Boeuf River Cut-Off No. 2	Morehouse	Sept. 15, 1909	Oct. 11, 1910	251	.....	3,930	982.50	25.00	Boeuf River.	
9	Boeuf River Cut-Off No. 3	Morehouse	Sept. 15, 1909	Oct. 11, 1910	133	.....	1,445	317.90	22.00	Boeuf River.	
	Totals				12,272	34,365	1,157,969	$274,020.13	.....		
	Less work done previous to Apr. 20, '10, and not comp'd Apr. 20, '12.				3,900	3,831	386,874	$90,056.28	.....		
	Work done from April 20, 1910, to April 20, 1912				8,372 or 1.58 miles.	30,534 or 5.78 miles.	771,095	$183,963.85	.....	.....	Aver. price per cu. yd., 23.86 cts.

Levee work undertaken by the Board of Commissioners of the Fifth Louisiana Levee District, under nineteen contracts entered into from April 20, 1910, to April 20, 1912, with three contracts of earlier date not completed April 20, 1910.

Number	Name of Contract.	Parish.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Cost.	Price—Cents.	Stream.	REMARKS.
1	Wilson Point	East Carroll	June 2, 1910	Jan. 6, 1911	.....	7,843	62,565	$10,855.03	17.35	Mississippi Riv.	
2	Cottonwood Enlargement	East Carroll	Aug. 20, 1908	May 20, 1910	.....	2,590	28,655	6,848.55	23.90	Mississippi Riv.	
3	Longwood	East Carroll	.....	May 30, 1910	.....	.....	7,375	147.50	2.00	Mississippi Riv.	Bonus paid by Dist. on State Contract.
4	Elton	East Carroll	May 25, 1910	Nov. 10, 1911	.....	13,720	81,899	18,836.77	23.00	Mississippi Riv.	
5	Wyly to Hollybrook	East Carroll	May 25, 1910	.....	.....	16,500	192,081	42,834.06	22.30	Mississippi Riv.	
6	Point Look Out Spur	East Carroll	.....	Aug. 2, 1910	.....	645	11,856	2,815.80	23.75	Mississippi Riv.	
7	Atherton	East Carroll	Dec. 28, 1910	Mar. 14, 1911	2,593	.....	43,083	9,237.00	12.44	Mississippi Riv.	
8	Wilton	East Carroll	May 26, 1910	May 6, 1911	.....	10,524	119,200	21,336.80	17.90	Mississippi Riv.	
	Atherton Section		.....	.....	.....	2,254	24,013	4,298.33	17.90	Mississippi Riv.	
9	Villa Vista Sec. No. 1	East Carroll	Mar. 16, 1911	.....	.....	10,646	126,922	18,378.30	14.48	Mississippi Riv.	
10	Villa Vista Sec. No. 2	and Madison	Mar. 16, 1911	Feb. 17, 1912	3,344	.....	169,375	24,525.50	14.48	Mississippi Riv.	
11	Mascot Section 1	Madison	Feb. 21, 1911	Dec. 7, 1911	1,910	.....	97,642	14,036.87	15.40	Mississippi Riv.	
12	Mascot Section 2	Madison	Feb. 21, 1911	Nov. 1, 1911	1,800	.....	97,271	14,979.73	15.40	Mississippi Riv.	
13	Mascot Section 3	Madison	Feb. 21, 1911	Aug. 31, 1911	1,800	.....	87,633	13,495.48	15.40	Mississippi Riv.	
14	Mascot Section 4	Madison	Feb. 21, 1911	Nov. 1, 1911	1,900	.....	79,107	12,182.48	15.40	Mississippi Riv.	
15	Mascot Section 5	Madison	Feb. 21, 1911	Aug. 31, 1911	1,908	.....	62,728	9,660.11	15.40	Mississippi Riv.	
16	Martin to Bedford Banquette	Madison	Dec. 4, 1908	June 20, 1911	.....	20,310	57,378	13,714.34	23.90	Mississippi Riv.	
17	Biggs	Madison	Sept. 4, 1911	.....	.....	9,505	90,000	28,800.00	32.00	Mississippi Riv.	
18	Reid	Madison	Sept. 4, 1911	.....	.....	9,078	75,000	26,250.00	35.00	Mississippi Riv.	
19	Diamond Island Topping	Madison	Aug. 20, 1908	Nov. 25, 1910	.....	9,490	36,592	11,124.51	38.60	Mississippi Riv.	
20	Cocodrie	Concordia	Sept. 15, 1910	Jan. 24, 1911	.....	2,245	17,310	2,463.21	14.23	Mississippi Riv.	
21	Windemere	Concordia	Sept. 15, 1910	Mar. 25, 1911	.....	3,205	26,780	3,980.22	14.90	Mississippi Riv.	
22	Claremont	Concordia	Sept. 15, 1910	.....	.....	16,463	139,000	19,043.00	13.70	Mississippi Riv.	
	Totals				15,255	135,018	1,733,465	$329,843.59	.....		
	Less work done previous to Apr. 20, '10, and not comp'd Apr. 20, '12.				.....	45,823	340,103	90,068.86	.....		
	Work done from April 20, 1910, to April 20, 1912				15,255 or 2.89 miles.	89,195 or 16.89 miles.	1,393,362	$239,774.73	.....	.....	Aver. price per cu. yd., 17.20 cts.

Levee work undertaken by the Board of Commissioners of the Atchafalaya Basin Levee District, under eight contracts entered into from April 20, 1910, to April 20, 1912, with two contracts of earlier date not completed April 20, 1910.

Number	Name of Contract.	Parish.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Cost.	Price—Cents.	Stream.	REMARKS.
1	Upper Morganza	Pointe Coupee.	Jan. 29, 1910	Dec. 27, 1910	5,274	.....	259,416	$51,883.20	20.00	Mississippi Riv.	
2	Upper Allendale	W. Baton R'ge.	Aug. 25, 1910	July 11, 1911	2,651	.....	148,700	26,766.00	18.00	Mississippi Riv.	
3	Belair	W. Baton R'ge.	July 26, 1911	Oct. 18, 1911	1,360	.....	36,436	4,736.68	13.00	Mississippi Riv.	
4	Levert ..... Upper	Ascension.	July 26, 1911	.....	1,427	.....	47,000	6,768.00	14.40	Mississippi Riv.	
	Lower		.....	.....	6,251	.....	187,834	27,048.09	14.40	Mississippi Riv.	
5	Ascension-New Hope.	Ascension.	Apr. 26, 1911	.....	.....	8,561	77,579	10,434.38	13.45	Mississippi Riv.	
6	New Hope to Souvenir	Ascension.	Aug. 24, 1910	April 19, 1911	3,104	3,414	120,051	14,886.32	12.40	Mississippi Riv.	
7	Smoke Bend	Ascension.	.....	April 23, 1910	.....	1,040	9,345	1,848.60	scale	Mississippi Riv.	
8	Haygood	Pointe Coupee.	Feb. 12, 1912	.....	5,033	.....	104,800	18,864.00	18.00	Atchafalaya R.	
9	Holloway to Sherman Bayou	Pointe Coupee.	Jan. 18, 1911	.....	.....	38,094	228,169	34,202.53	14.99	Atchafalaya R.	
10	Alabama Bayou-Island	Pointe Coupee.	Sept. 24, 1909	Mar. 4, 1912	14,709	.....	338,284	150,399.34	38½	Atchafalaya R.	Inc. $20,160 for Timber Dam.
	Totals				39,809	51,109	1,557,614	$347,837.14	.....		
	Less work done previous to Apr. 20, '10, and not comp'd Apr. 20, '12.				7,677	18,511	343,182	53,780.06	.....		
	Work done from April 20, 1910, to April 20, 1912				32,132 or 6.09 miles.	32,598 or 6.17 miles.	1,214,432	$294,057.08	.....	.....	Aver. price per cu. yd., 22.54 cts.

APPENDIX A. STATEMENT NO. 5. PONTCHARTRAIN LEVEE DISTRICT.

Levee work undertaken by the Board of Commissioners of the Pontchartrain Levee District, under three contracts entered into from April 20, 1910, to April 20, 1912, with one contract of earlier date not completed April 20, 1910.

Number	Name of Contract.	Parish.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Cost.	Price—Cents.	Stream.	REMARKS.
1	South Boulevard to Protection Levee	E. Baton R'ge.	Feb. 29, 1912	.....	.....	2,650	25,000	$11,250.00	45.00	Mississippi Riv.	
2	Conrad	E. Baton R'ge.	.....	July 31, 1911	.....	1,610	7,877	945.24	12.00	Mississippi Riv.	
3	Billings-Point Store Section	Iberville	Sept. 15, 1910	Feb. 4, 1911	363	.....	6,672	1,082.86	16.23	Mississippi Riv.	See State Contract.
4	Landry	Ascension	Sept. 30, 1909	Aug 24, 1910	2,085	1,080	95,845	14,788.88	15.43	Mississippi Riv.	
5	Deckbar Wooden Revetment	Jefferson	Dec. 1910	Feb. 4, 1911	.....	.....	.....	1,999.20	.....	Mississippi Riv.	1,176 ft. of rev't.
	Totals				2,448	5,340	135,394	$30,066.18	.....		
	Less work done previous to April 20, 1910				800	2,650	42,300	13,919.39	.....		
	Work done from April 20, 1910, to April 20, 1912				1,648 or 0.31 miles.	2,690 or 0.51 miles.	93,094	$16,146.79	.....	.....	Aver. price per cu. yd., 15.20 cts.

APPENDIX A. STATEMENT. No. 6. LAFOURCHE LEVEE DISTRICT.

Levee work undertaken by the Board of Commissioners of the Lafourche Levee District, under four contracts entered into from April 20, 1910, to April 20, 1912.

Number	Name of Contract.	Parish.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Cost.	Price—Cents.	Stream.	REMARKS.
1	Dugas-Landry	Ascension	Oct. 13, 1910	Dec. 28, 1910	.....	1,375	2,927	$526.86	18.00	Mississippi Riv.	
2	Flagville	St. Charles	Oct. 18, 1909	Sept. 20, 1910	585	.....	9,141	1,965.31	21½	Mississippi Riv.	
3	Stevenson to We Go.	St. John	Oct. 13, 1910	Dec. 8, 1910	.....	3,800	8,285	1,387.74	16.75	Mississippi Riv.	
4	Company Canal	Jefferson	Oct. 13, 1910	Nov. 17, 1910	471	.....	3,988	1,196.40	30.00	Mississippi Riv.	
	Work done from April 20, 1910, to April 20, 1912				1,056 or 0.20 miles.	5,175 or 0.98 miles.	24,341	$5,076.31	.....	.....	Aver. price per cu. yd., 20.85 cts.

APPENDIX A. STATEMENT NO. 7. LAKE BORGNE BASIN LEVEE DISTRICT.

Levee work undertaken by the Board of Commissioners of the Lake Borgne Basin Levee District, under three contracts entered into from April 20, 1910, to April 20, 1912.

Number	Name of Contract.	Parish.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Cost.	Price—Cents.	Stream.	REMARKS.
1	Scarsdale-Martin Sec.	Plaquemines...	See State Contract.		1,212	.....	14,285	$3,128.42	21.90	Mississippi Riv.	
2	Fairview	Plaquemines...	Oct. 10, 1911	Feb. 13, 1912	1,618	.....	26,679	4,666.16	17.49	Mississippi Riv.	
3	Vic Adema to Prosper Gagnet	Plaquemines...	Dec. 1, 1910	Feb. 9, 1911	.....	2,590	9,861	2,045.17	20.74	Mississippi Riv.	
4	Pointe a la Hache Capping	Plaquemines...	.....	Mar. 2, 1911	.....	6,005	3,290	690.90	21.00	Mississippi Riv.	
	Work done from April 20, 1910, to April 20, 1912.....				2,830 or 0.54 miles.	8,595 or 1.63 miles.	54,115	$10,530.65	.....		Aver. price per cu. yd., 19.46 cts.

APPENDIX A. STATEMENT NO. 8. PLAQUEMINES PARISH EAST BANK LEVEE DISTRICT.

Levee work undertaken by the Board of Commissioners of the Plaquemines Parish East Bank Levee District, under two contracts entered into previous to and not completed April 20, 1910.

Number	Name of Contract.	Parish.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Cost.	Price—Cents.	Stream.	REMARKS.
1	Gulf Coast Sec. 1....	Plaquemines...	Jan. 5, 1906	May 18, 1911	.....	72,554	231,038	$30,343.19	12.35	Gulf Coast.	Inc. $1,810.00 for clearing.
2	Gulf Coast Sec. 2....	Plaquemines...	Jan. 5, 1906	May 18, 1911	97,931	.....	666,536	81,424.52	11.85	Gulf Coast.	Inc. $2,440.00 for clearing.
	Totals				97,931	72,554	897,574	$111,767.71	.....		
	Less work done previous to April 20, 1910				70,000	72,554	706,638	86,701.79	.....		
	Work done from April 20, 1910, to April 20, 1912				27,931 or 5.29 miles.		190,936	$25,065.92	.....		Aver. price per cu. yd., 11.85 cts.

Levee work undertaken by the Board of Commissioners of the Caddo Levee District, under thirteen contracts entered into from April 20, 1910, to April 20, 1912, and two contracts of earlier date not completed April 20, 1910.

Number	Name of Contract.	Parish.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Cost.	Price—Cents.	Stream.	REMARKS.
1	Missionary	Caddo	Sept. 8, 1910	Dec. 26, 1910	3,491	.....	74,734	$12,256.38	16.40	Red River.	
2	Scotts Slough	Caddo	Sept. 8, 1910	Jan. 20, 1911	.....	3,815	26,725	4,997.57	18.70	Red River.	
3	Rattling Slough	Caddo	Apr. 13, 1910	Jan. 2, 1911	432	4,060	39,810	7,424.56	18.65	Red River.	
4	Upper Rush Point	Caddo	Nov. 1, 1910	Apr. 5, 1911	3,040	.....	28,028	3,251.25	11.60	Red River.	
5	Crescent – Wood's Place Section	Caddo	Oct. 2, 1909	May 19, 1910	1,976	.....	15,242	2,549.99	12.73	Red River.	
6	Rush Point	Caddo	Sept. 8, 1910	Dec. 19, 1910	2,795	.....	32,383	4,209.79	13.00	Red River.	
7	Sterling Bayou	Caddo	Sept. 8, 1910	Dec. 31, 1910	2,568	.....	34,077	2,045.12	12.19	Red River.	
8	Cash Point to Twelve Mile Bayou	Caddo	Sept. 8, 1910	Mar. 6, 1911	.....	3,280	12,466	1,869.90	15.00	Red River.	
9	Cuba to Mulhaupt Section 1	Caddo	Dec. 16, 1911	.....	8,200	.....	73,320	8,211.84	11.20	Red River.	
10	Cuba to Mulhaupt Section 2	Caddo	Dec. 16, 1911	.....	9,152	.....	82,000	9,348.00	11.40	Red River.	
11	Twelve Mile Bayou to Cross Bayou	Caddo	Feb. 14, 1912	.....	22,648	.....	165,000	26,268.00	15.92	Red River.	
12	Shreves Island	Caddo	Sept. 8, 1910	Mar. 23, 1911	3,688	.....	41,639	5,712.87	13.72	Red River.	
13	Kentucky	Caddo	Sept. 8, 1910	Jan. 20, 1911	2,920	.....	38,603	6,060.67	15.70	Red River.	
14	Robson	Caddo	Nov. 1, 1910	Jan. 20, 1911	1,892	.....	29,413	3,494.26	11.88	Red River.	
15	Beaird	Caddo	Nov. 1, 1910	Feb. 18, 1911	1,615	.....	7,053	831.25	11.80	Red River.	
	Totals				64,417	11,155	700,493	$98,531.45	.....		
	Less work done previous to Apr. 20, '10, and not comp'd Apr. 20, '12.				36,705	.....	290,320	40,504.76	.....		
	Work done from April 20, 1910, to April 20, 1912				27,712 or 5.25 miles.	11,158 or 2.11 miles.	410,173	$58,026.69	.....	.....	Aver. price per cu. yd., 14.15 cts.

APPENDIX A. STATEMENT NO. 10. RED RIVER, ATCHAFALAYA AND BAYOU BŒUF LEVEE DISTRICT.

Levee work undertaken by the Board of Commissioners of the Red River, Atchafalaya and Bayou Boeuf Levee District, under three contracts entered into from April 20, 1910, to April 20, 1912.

Number	Name of Contract.	Parish.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Cost.	Price—Cents.	Stream.	REMARKS.
1	Elba	St. Landry	Sept. 20, 1911		963	.....	13,361	$2,391.62	17.90	Atchafalaya R.	
2	Latanier South (600—690)	St. Landry	May 16, 1910	Feb. 13, 1911	9,000	.....	178,544	39,279.68	22.00	Atchafalaya R.	
3	Latanier South (805—855+)	St. Landry	Sept. 8, 1911		5,000	.....	130,250	28,655.00	22.00	Atchafalaya R.	
	Totals				14,963	.....	322,155	$70,326.30	.....		
	Less work not completed April 20, 1912				4,545	.....	113,811	24,728.42	.....		
	Work done from April 20, 1910, to April 20, 1912				10,418 or 1.97 miles.	.....	208,344	$45,597.88	.....	.....	Aver. price per cu. yd., 22.10 cts.

APPENDIX A. STATEMENT NO. 11 RED RIVER AND BAYOU DES GLAIZES LEVEE AND DRAINAGE DISTRICT.

Levee work undertaken by the Board of Commissioners of the Red River and Bayou Des Glaizes Levee and Drainage District under one contract entered into previous to April 20, 1910, and not completed by that date.

1	Davids Ferry South No. 2	Avoyelles	Feb. 7, 1910	Feb. 18, 1911	21,100	.....	336,208	$84,052.00	25.00	Red River.	
	Work done from April 20, 1910, to April 20, 1912				21,100 or 4.00 miles.	.....	336,208	$84,052.00	.....		

APPENDIX A. STATEMENT NO 12. RED RIVER, ATCHAFALAYA AND BAYOU BŒUF LEVEE DISTRICT.

Drainage work undertaken by the Board of Commissioners of the Red River, Atchafalaya and Bayou Bœuf Levee District, under two contracts entered into previous to April 20, 1910, and not completed at this date.

Number	Name of Contract.	Parish.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Cost.	Price—Cents.	Stream.	REMARKS.
1	Swaze Lake to Bayou Courtableau	St. Landry	Dec. 3, 1906	Nov. 26, 1910	103,600	22.26	450,973	$136,212.97	17.98		Inc. $51,198.00 for clearing.
2	Bayou Big Jack Sec.	St. Landry	Mar. 24, 1910	Nov. 26, 1910	7,245	1.37	34,453	5,218.18	6.00		Inc. $3,151.00 for clearing. O., G. and N. E. R. R. paid $2,067 add.
	Totals				110,845	23.63	485,426	$141,431.15	.....		
	Less work done previous to April 20, 1910				102,845	21.00	447,587	131,271.31	.....		
	Work done from April 20, 1910, to April 20, 1912				8,000 or 1.51 miles.	2.63	37,839	$10,159.84	.....	.....	Aver. price per cu. yd., 10.86 cts.

APPENDIX A. STATEMENT NO. 13. JOINT ORGANIZATION ATCHAFALAYA BASIN AND LAFOURCHE LEVEE DISTRICTS.

Work for improvement of Bayou Lafourche undertaken by the Board of Commissioners of the Atchafalaya Basin and the Lafourche Levee Districts, under two contracts entered into from April 20, 1910, to April 20, 1912, and one of earlier date not completed April 20, 1910.

Number	Name of Contract.	Parish.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Cost.	Price—Cents.	Stream.	REMARKS.
1	Cancienne Canal	Assumption	Sept. 30, 1907	May 9, 1910	7,365	.....	206,507	$30,976.05	15.00		
2	Cancienne Canal Extension	Assumption	May 27, 1910	Feb. 1, 1911	9,135	.....	103,717	15,577.55	15.00		
3	Cancienne Canal Clearing and Dredging	Assumption	Jan. 30, 1911	Mar. 1, 1911	.....	.....	.....	1,000.00	.....		Paid by force acct
	Totals				16,500	.....	310,224	$47,533.60	.....		
	Less work done previous to April 20, 1910				5,900	.....	164,500	24,675.00	.....		
	Work done from April 20, 1910, to April 20, 1912				8,000 or 2.01 miles.	2.63	37,839	$10,159.84	.....	.....	Aver. price per cu. yd., 15.00 cts.

The Board of State Engineers is indebted to the Orleans Levee Board for the following statement of work undertaken by the Board of Levee Commissioners, under eighteen contracts, entered into from April 20, 1910, to April 20, 1912.

Number	Name of Contract.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement of Levee.	Cubic Yards.	Price. Cents per Cubic Yard.	Cost of Earthwork.	REVETMENT. Linear Feet.	REVETMENT. Feet, B. M.	REVETMENT. Price per M. Feet, B. M.	REVETMENT. Cost.	Allowed on Force Acct. Claims, etc.	Total Cost.
1	Press to Louisa St.	Apr. 1, 1910	Apr. 30, 1910	.....	1,440	5,108.6	105.0	$5,364.07	.....	.....	.....	.....	.....	$5,364.07
2	Furnishing earth for levee construction bet. h'd of Carondelet Canal and Hagan Av	Mar. 19, 1910	May 11, 1910	.....	7,000	1,102.3	45.0	496.03	.....	.....	.....	.....	.....	496.03
3	Repaving ramp at Jackson Avenue..	Apr. 30, 1910	May 31, 1910	1,014.2 sq. yds. paving at 45c per sq. yd., and 2 96 linear ft. curbing at 8c per ft..										497.07
4	Furnishing earth west bank Bayou St. John, Magnolia Bridge to Esplanade Bridge...	Aug. 3, 1910	Oct. 3, 1910	.....	1,419	522.1	60.0	313.23	.....	.....	.....	.....	.....	313.23
5	Walnut to Joseph Street, Levee and Revetment	Sept. 28, 1910	Apr. 19, 1911	.....	6,652	120,163.3	29.5	35,448.16	2,782	117,489	$51.00	$5,991.94	.....	41,440.10
6	East bank, New Basin Canal, Magnolia St. to Carrollton Av.....	July 18, 1910	Jan. 17, 1912	.....	9,800	9,238.7	19⅞	1,836.19	.....	.....	.....	.....	.....	1,836.19
7	West bank, New Basin Canal, Magnolia St. to Carrollton Av.....	Sept. 9, 1910	Mar. 22, 1912	.....	10,000	13,044.4	83.0	10,826.85	.....	.....	.....	.....	.....	10,826.85
8	Clouet St. Enlargement	Dec. 3, 1910	Jan. 6, 1911	.....	183	869.7	93.0	808.81	.....	.....	.....	.....	.....	808.81
9	East bank, New Basin Canal, Carrollton Av. to Metairie Bridge....	Feb. 8, 1911	.....	.....	3,400	1,310.8	17.0	222.83	.....	.....	.....	.....	.....	222.83

10	Filling against Bulkhead, Wm. A. Kernaghan Whf.	Mar.	15, 1911	July	5, 1911	.....	3,171	38,794.8	23.7	9,194.37	.....	.....	.....	.....	.....	9,194.37
11	Demolishing H. T. Lawler Milling & Trading Co. Concrete Building.	June	2, 1911	Sept.	19, 1911	Price bid for work, $8,300.00.				.....	.....	.....	.....	.....	$312.44	8,612.44
12	Removal of Wharf, Pile Bulkhead, etc., Charbonet St. to St. Maurice.	July	26, 1911	Aug.	3, 1911	$420.00 for all work in accordance with specifications ...				.....	.....	.....	.....	.....	.....	420.00
13	Delivery of earth in embankment, Kentucky St. to Ursuline Convent.	Aug.	28, 1911	Dec.	26, 1911	.....	514	3,189.3	51.0	1,626.54	.....	.....	.....	.....	.....	1,626.54
14	Montegut to Louisa Street	Aug.	30, 1911	.....	.....	.....	1,255	54,000.0	57.6	24,883.20	.....	.....	.....	.....	1,569.49	26,452.69
15	Pile Bulkhead, Egania to Alabo Street	Oct.	3, 1911	.....	.....	1,960 ft. at $8.80 per running ft.....				.....	.....	.....	.....	.....	.....	*16,601.09
16	Pile Bulkhead, St. Maurice Av. to Parish Line.....	Feb.	27, 1912	.....	.....	1,450 ft. at $8.19 per running ft.....				.....	.....	.....	.....	.....	.....	.....
17	Gov. Nicholls to Port Street.....	.....	.....	.....	.....	.....	2,960	46,000.0	Built by the M. L. & T. R. R. & S. S. Co.....						.....	.....
18	Port to Montegut Street	.....	.....	.....	.....	.....	1,080	32,529.0	Built by the N. O. & N. E. R. R. Co						.....	.....
	Totals.....	.....	.....	.....	.....	.....	48,874	325.873.0	.....	$91,020.28	2,782	117,489	.....	$5,991.94	$1,881.93	$124,712.31
													Average price per cubic yard, 27.93 cents.			
	The following contract reported not completed in the last biennial report, has since been completed:															
	Carrollton Reach Levee and Rev't.....	July	23, 1909	Feb.	17, 1911	3,242	7,140	414,587.7	33.33	$138,215.40	5,690	280,866	$61.25	$17,203.04	.....	$155,418.44

*Paid on Acct.

Of Contract Work Undertaking by the Board of Levee Commissioners of the Orleans Levee District, Entered into from June 4th, 1907, to April 1st, 1912.

Number	Name of Contract.	DATE OF		LINEAR FT.		Cubic Yards.	Price—Cents.	Cost.	REVETMENT.				Allowed on Claims, etc.	Total Cost.
		Contract.	Final Certificate.	New Levee.	Enlargement.				Linear Feet.	Feet, B. M.	Price per M. Feet, B. M.	Cost.		
1	Couret Place, New Levee	June 26, 1907	Mar. 19, 1908	1,693	.....	53,946.3	27.75	$ 15,135.09	.....	.....	.....	.....	.....	$ 15,135.09
2	Seventh to Third St., New Levee	Aug. 30, 1907	Jan. 21, 1909	1,475	.....	74,732.7	97.5 (94.5)	72,864.36	.....	.....	.....	.....	$ 2,224.90	75,089.26
3	New Levee, Elmira to Mazant St.	Aug. 30, 1907	Jan. 21, 1909	2,016	.....	133,531.2	(41.5)	112,263.40	2,016	110,796	$70.00	$ 7,755.72	3,131.22	123,150.34
										.....	.....	.....	8,750.00	8,750.00
4	New revetment & Enlargement of Levee, Algiers Saw Mill to S. P. Yards	Sept. 13, 1907	Dec. 21, 1907	.....	654.0	3,608.0	43.0	1,551.44	654	60,787	45.50	2,765.81	.....	4,317.25
5	Banquette, 6th and 7th Districts	Sept. 3, 1907	Mar. 30, 1908	.....	5,318.0	24,803.0	43.0	10,665.29	.....	.....	.....	.....	.....	10,665.29
6	New Revetment, Convent to Huget	Sept. 13, 1907	Jan. 16, 1908	.....	.....	600.0	25.0	150.00	3,508	180,413	61.75	11,140.50	.....	11,290.50
7	Beka Plantation, New Levee	Oct. 14, 1907	Dec. 28, 1909	7,745	.....	127,374.1	29.45	37,511.67	.....	.....	.....	.....	175.00	37,686.67
8	Lower Delacroix to Upper Beka Plantation, New Levee and Rev't.	Oct. 14, 1907	Feb. 3, 1909	3,409	.....	65,823.5	23.0	15,139.40	3,440	170,703	85.00	14,509.76	2,408.17	32,057.33
9	Egania to Andry St., New Levee	Oct. 25, 1907	Feb. 13, 1908	407	.....	5,207.5	82.0	4,270.15	.....	.....	.....	.....	.....	4,270.15
10	Filling behind wharf, St. Andrew to Jackson Avenue	Nov. 5, 1907	Apr. 23, 1908	.....	900.0	9,149.5	65.0	5,947.18	.....	.....	.....	.....	.....	5,947.18

11	Filling behind wharf, St. Andrew to Celeste Street	Jan	22, 1908	Mar.	6, 1908		695.5	3,082.5	55.0	1,695.37						1,695.37
12	Removal of skeleton wharf and Pile Bulkhead	Feb.	26, 1908	Sept.	26, 1908						Remo	ving 3,905	piles	@ $4.20	per pile	16,401.00
13	Placing earth on River Front, bet. St. Andrew and Celeste Streets	Feb.	29, 1908	Apr.	23, 1908			976.3	50.0	488.15						488.15
14	Placing earth on River Front, 4th District	Mar.	17, 1908	Sept.	19, 1908			12,180.8	65.0	7,917.55						7,917.55
15	Placing filling, Commercial Front, 4th Dist.	Apr.	14, 1908	June	4, 1908			2,350.4	50.0	1,175.20						1,175.20
16	Building Ramps	June	4, 1908	Aug.	24, 1908			3,085.0	65.0	2,005.23						2,005.23
17	Levee Improvem't, Julia to Lafayette Street	Sept.	13, 1908	Dec.	19, 1908		1,049.0	1,236.0	45.0	556.20						556.20
18	New Levee and Revetment, Louisa to Desire St	Sept.	14, 1908	Mar.	15, 1909	653		45,653.4	90.0	41,088.06	653	33,537	70.00	2,347.59		43,435.65
19	New Levee and Revetment, Mazant to Poland St	Sept.	14, 1908	Feb.	5, 1909	1,147		77,308.1	90.0	69,577.30	1,205	64,480	70.00	4,513.60	1,236.51	75,327.41
20	Removal of skeleton wharf and Pile Bulkhead	Sept.	30, 1908	Feb.	25, 1909						Remo	ving 3,514	piles	@ $2.90	per pile	10,190.60
21	Banquet to Beka, New Levee	June	19, 1908	Sept.	17, 1908		5,000.0	6,956.2	19.0	1,321.68					66.50	1,388.18
22	Upper Stanton, Levee	Nov.	4, 1908	Feb.	9, 1909	1,496		40,682.8	25.4	10,333.43						10,333.43
23	New Levee, Alabo to St. Maurice St.	Nov.	12, 1908	Feb.	15, 1909	640		14,583.8	115.0	16,771.36					300.00	17,071.36
24	New Levee, Jackson Av. to 3rd St.	Sept.	14, 1908	Mar.	15, 1909	3,171		37,824.6	90.00	34,042.11					209.83	34,251.94
25	New Levee, 7th St. to Louisiana Av.	Sept.	14, 1908	Mar.	4, 1909	2,034		57,775.5	90.00	51,997.96					939.52	52,937.48
26	Revetment, Beka, New Levee	Nov.	27, 1908	Jan.	30, 1909						7,810	245,074	28.75	7,045.88		7,045.88
27	Metairie Road to West End	Mar.	29, 1909	Abandoned.		14,494		76,024.7	31.0	20,629.39					4,238.53	24,867.92
28	Carrollton Reach Levee and rev't.	July	23, 1909	Feb.	17, 1911	3,242	7,140.00	414,687.7	33.33	138,215.40	5,690	280,866	61.25	17,203.04		155,418.44

Number	Name of Contract.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Price—Cents.	Cost.	REVETMENT. Linear Feet.	REVETMENT. Feet, B. M.	REVETMENT. Price per M. Feet, B. M.	REVETMENT. Cost.	Allowed on Claims, etc.	Total Cost.
29	Emergency pumping of banks....	Aug. 21, 1909	Sept. 17, 1909	.....	.....	.....	.....	.....	126	hours @ 2.50 per hour...			.....	315.00
30	Placing earth behind Bulkhead, Canal to Lafayette Street.....	Oct. 20, 1909	Jan. 14, 1910	.....	999.0	3,593.7	25.00	898.42	.....	.....	.....	.....	.....	898.42
31	Metairie Road to West End.....	Dec. 9, 1909	Mar. 31, 1910	.....	12,094.0	43,660.3	74.00	32,308.61	.....	.....	.....	.....	.....	32,308.61
32	Commercial Front, Girod to St. Mary Street	Jan. 13, 1910	Apr. 8, 1910	.....	.....	2,408.0	35.00	842.80	.....	.....	.....	.....	.....	842.80
33	Beka Crevasse....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	44,483.27
34	Bayou St. John Crevasse	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	544.82
35	Enlargement of Press to Louisa Street Levee.....	Apr. 1, 1910	Apr. 30, 1910	.....	1,440.0	5,108.6	105.0	5,364.07	.....	.....	.....	.....	.....	5,364.07
36	Furnishing earth bet. head Carondelet Canal and Hagan Avenue...	Mar. 19, 1910	May 11, 1910	.....	7,746.0	1,102.3	45.00	496.03	.....	.....	.....	.....	.....	496.03
37	Repaving Ramp to Ferry Landing at Jackson Avenue.	Apr. 30, 1910	May 31, 1910	1,014	2 Sq. Yds. @ 45 cents; 296 lin. ft. of curbing @ 8 cents, and $17.00 for removing material								.....	497.07
38	Bayou St. John, Magnolia Bridge to Esplanade Bridge	Aug. 3, 1910	Oct. 3, 1910	.....	1,419.0	522.0	60.00	313.23	.....	.....	.....	.....	.....	313.23
39	Walnut to Joseph Street	Sept. 28, 1910	Apr. 19, 1911	.....	6,652.0	120,163.3	29.50	35,448.16	2,782	117,489	51.00	5,991.94	.....	41,440.10
40	East Bank New Basin Canal, Magnolia Bridge to Carrollton Av....	June 18, 1910	Jan. 17, 1912	.....	9,800.0	9,238.7	19⅞	1,836.19	.....	.....	.....	.....	.....	1,836.19

41	West Bank New Basin Canal, Magnolia Bridge to Carrollton Av....	Sept.	9, 1910	Mar.	22, 1912	.....	10,000.0	13,044.4	83.00	10,826.85	.....	.....	.....	.....	.....	10,826.85
42	Clouet St. Levee Enlargement	Dec.	3, 1910	Jan.	6, 1911	.....	183.0	869.7	93.00	808.81	.....	.....	.....	.....	.....	808.81
43	East Bank New Basin Canal, Carrollton Av. Bridge to Metairie Cemetery Bridge.....	Feb.	8, 1911	.....	.....	.....	3,400.0	1,310.8	17.00	222.83	.....	.....	.....	.....	.....	222.83
44	Filling against Bulkhead to Wm. A Kernaghan Wharf	Mar.	15, 1911	July	5, 1911	.....	3,171.0	38,794.8	23.70	9,194.37	.....	.....	.....	.....	.....	9,194.37
45	Demolishing H. T. Lawlor M. & T. Co. Concrete Bldg	June	21, 1911	Sept.	19, 1911	....	Price bid for work, $8,300.00.					.....	.....	.....	312.44	8,612.44
46	Removal of Wharf, Pile Bulkhead, etc., Charbonnet St. to St. Maurice Av.....	July	26, 1911	Aug.	3, 1911	.....	Price bid for all work in accordance w th specifications.....							.....	.....	420.00
47	Delivering earth in embankment, Kentucky St. to Ursuline Convent.	Aug.	28, 1911	Dec.	26, 1911	.....	514.0	3,183.3	51.00	1,626.54	.....	.....	.....	.....	.....	1,626.54
48	Montegut to Louisa Street	Aug.	30, 1911	.....	.....	.....	1,255.0	54,000.0	57.60	24,883.20	.....	.....	.....	.....	1,569.49	26,452.69
49	Pile Bulkhead, Egania to Alabo Street	Oct.	3, 1911	.....	.....	.....	1,960 lin. fa. @ 8.80 per running foot.					.....	.....	.....	.....	*16,601.09
50	Pile Bulkhead, St. Maurice Av. to Parish Line.....	Feb.	27, 1912	.....	.....	.....	1,450 lin. ft. @ $8.19 per running foot.									
51	Gov. Nicholls to Port Street.....	.....	.....	.....	.....	.....	2,960.0	46,000.0	Built by the M. L. & T. R. R. & S. S. Co.....			.....	.....	.....	.....	.....
52	Port to Montegut Street	.....	.....	.....	.....	.....	1,080.0	32,529.0	Built by the N. O. & N. E. R. R. Co..			.....	.....	.....	.....	.....
	Totals.....	.....	.....	.....	.....	43,622	83,469.5	1,668,718.5		$798,382.48	27,758	1,264,145		$73,273.84	$25,562.11	$994,971.28

*Paid on Acct.

Recapitulation of work done from April 20, 1910, to April 20, 1912, as shown in the foregoing.

DISTRICT.	Miles of		Cubic Yards.	Cost.	REMARKS.
	New Levee.	Enlargement of Levee.			
Tensas Basin	1.58	5.78	771,095	$183,963.85	
Fifth Louisiana	2.89	16.89	1,393,362	239,774.73	
Atchafalaya Basin	6.09	6.17	1,214,432	294,057.08	
Pontchartrain	0.31	0.51	93,094	16,146.79	
Orleans	0.61	10.62	503,776	220,875.43	
Lafourche	0.20	0.98	24,341	5,076.31	
Lake Borgne Basin	0.54	1.63	54,115	10,530.65	
Plaquemines Parish East Bank	5.29	1.37	190,936	25,065.92	
Caddo	5.25	2.11	410,173	58,026.69	
Red River, Atchafalaya and Bayou Boeuf	1.97	.....	208,344	45,597.88	
Red River and Bayou des Glaizes	4.00	.....	336,208	84,052.00	
Totals	28.73	46.06	5,199,876	$1,183,167.33	
DRAINAGE.	MILES OF Excavation.	MILES OF Clearing.			
Red River, Atchafalaya and Bayou Boeuf	1.51	2.63	37,839	$10,159.84	
IMPROVING BAYOU LAFOURCHE.	MILES OF Excavation.	MILES OF Clearing.			
Atchafalaya Basin and Lafourche	2.01	.....	145,724	$22,858.60	

APPENDIX A. STATEMENT NO. 17.

Tabulated statement showing number of cubic yards and cost involved in 23 contracts (District and State) entered into previous to April 20, 1910, and not completed, with 107 contracts entered into between April 20, 1910, and April 20, 1912, divided into accounts showing work done under all; that is, previous to April 20, 1910, between April 20, 1910, and April 20, 1912, and still remaining to be done under existing contracts, April 20, 1912.

DISTRICT.	Work Done Previous to April 20, 1910.		Work Done from April 20, 1910, to April 20, 1912.		Work Remaining to be Done Under Existing Contracts.		Total Amounts Involved in Contracts.	
	Cubic Yards.	Cost.	Cubic Yards.	Cost.	Cubic Yards.	Cost.	Cubic Yards.	Cost.
				DISTRICT.				
Tensas Basin	337,800	$79,260.00	771,095	$183,963.85	49,074	$10,796.28	1,157,969	$274,020.13
Fifth Louisiana	65,300	15,606.70	1,393,362	239,774.73	274,803	74,462.16	1,733,465	329,843.59
Atchafalaya Basin	27,100	5,420.00	1,214,432	294,057.08	316,082	48,360.06	1,557,614	347,837.14
Pontchartrain	17,300	2,669.39	93,094	16,146.79	25,000	11,250.00	135,394	30,066.18
Lafourche	.....	.....	24,341	5,076.31	.....	.....	24,341	5,076.31
Lake Borgne Basin	.....	.....	54,115	10,530.65	.....	.....	54,115	10,530.65
Plaquemines Parish East Bank	706,638	86,701.79	190,936	25,065.92	.....	.....	897,574	111,767.71
Caddo	4,400	560.12	410,173	58,026.69	285,920	39,944.64	700,493	98,531.45
Red River, Atchafalaya and Bayou Boeuf	.....	.....	208,344	45,597.88	113,811	24,728.42	322,155	70,326.30
Red River and Bayou des Glaizes	.....	.....	336,208	84,052.00	.....	.....	336,208	84,052.00
Totals	1,158,538	$190,218.00	4,696,100	$962,291.90	1,064,690	$209,541.56	6,919,328	$1,362,051.46

STATEMENT NO. 17—Continued.

DISTRICT	Work Done Previous to April 20, 1910.		Work Done from April 20, 1910, to April 20, 1912.		Work Remaining to be Done Under Existing Contracts.		Total Amounts Involved In Contracts.	
	Cubic Yards.	Cost.	Cubic Yards.	Cost.	Cubic Yards.	Cost.	Cubic Yards.	Cost.
				STATE.				
Fifth Louisiana	274,401	$57,739.07	877,248	$219,839.07	478,198	$62,784.85	1,629,847	$340,362.99
Atchafalaya Basin	.....	.....	339,411	58,801.00	139,053	30,042.74	478,464	88,843.74
Pontchartrain	.....	.....	287,234	47,012.68	.....	.....	287,234	47,012.68
Lafourche	.....	.....	264,358	48,651.10	93,216	19,295.71	357,574	67,946.81
Lake Borgne Basin	25,591	4,129.43	130,139	25,307.89	29,543	5,527.54	185,273	34,964.86
Buras	.....	.....	52,986	24,957.02	.....	.....	52,986	24,957.02
Grand Prairie	23,023	3,220.92	86,836	30,203.91	.....	.....	109,859	33,424.83
Plaquemines Parish East Bank	.....	.....	201,203	40,268.64	5,050	1,085.75	206,253	41,344.39
Bossier	.....	.....	49,364	6,165.56	.....	.....	49,364	6,165.56
Bossier Sub	.....	.....	72,109	9,302.06	26,848	3,463.39	98,957	12,765.45
Red River Sub	.....	.....	35,581	8,005.72	.....	.....	35,581	8,005.72
Red River, Atchafalaya and Bayou Boeuf	.....	.....	402,850	80,897.37	56,500	12,430.00	459,350	93,327.37
Natchitoches Sub	.....	.....	12,521	1,502.52	111,000	17,448.90	123,521	18,951.42
Saline	.....	.....	80,285	11,632.06	25,956	3,893.40	106,241	15,525.46
Totals	323,015	$65,089.42	2,892,125	$612,536.60	965,364	$155,972.28	4,180,504	$833,598.30
				SUMMARY.				
Districts	1,158,538	$190,218.00	4,696,100	$962,291.90	1,064,690	$209,541.56	6,919,328	$1,362,051.46
State	323,015	65,089.42	2,892,125	612,536.60	965,364	155,972.28	4,180,504	833,598.30
Totals	1,481,553	$255,307.42	7,588,225	$1,574,828.50	2,030,054	$365,513.84	11,099,832	$2,195,649.76

APPENDIX A. STATEMENT No. 18. UNITED STATES LEVEES.

The Board of State Engineers is indebted to the courtesy of Captain J. A. Woodruff, Corps of Engineers, U. S. A., for the following statements of levees built and enlarged and revetment built and maintained for levee protection by the United States in the Upper Tensas District in Arkansas and Louisiana, from April 20, 1910, to April 20, 1912.

Name of Contract.	Parish. or County.	DATE OF Contract.	DATE OF Final Certificate.	LINEAR FT. New Levee.	LINEAR FT. Enlargement.	Cubic Yards.	Cost.	Price—Cents.	Stream.	REMARKS.
In Arkansas.										
871–916	Desha	Oct. 20, 1909	Dec. 29, 1910	.....	.....	109,506	$35,808.46	32.70	Ark. River.	Prev. con't annulled.
.....	.....	.....	.....	.....	.....	6,274	2,117.08	34.70	Ark. River.	Prev. con't annulled.
920-942	Desha	Aug. 5, 1910	Feb. 3, 1911	2,200	.....	93,962	32,886.70	35.00	Ark. River.	Prev. con't annulled.
942-957	Desha	Aug. 5, 1910	Mar. 15, 1911	1,500	.....	61,358	21,475.30	35.00	Ark. River.	
953	Desha	.....	Jan. 18, 1912	Spur.	.....	2,472	618.00	25.00	Ark. River.	Part Levee B'd con't.
360-390	Desha	May 27, 1907	Dec. 8, 1910	.....	.....	16,123	5,320.59	33.00	Mississippi Riv.	Beg. in prev. period.
1240-1360	Desha	July 17, 1909	Nov. 14, 1910	.....	.....	13,610	2,516.47	18.49	Mississippi Riv.	Beg. in prev. period.
1940-2050	Chicot	July 29, 1909	Jan. 16, 1911	.....	.....	81,797	16,277.60	19.90	Mississippi Riv.	Beg. in prev. period.
					Ditches..	4,905	882.90	18.00		
Total added in the two years				3,700 or 0.7 miles.	.....	390,007	$117,963.10	30.25	Average price.	
In Louisiana:										
1865-1985	East Carroll...	Aug. 6, 1910	Aug. 8, 1911	.....	13,230	111,741	$28,996.78	25.95	Mississippi Riv.	
2083-2135	East Carroll...	Sept. 9, 1911	.....	5,225	.....	*105,962	13,985.98	13.20	Mississippi Riv.	Not completed.
2135-2190	East Carroll...	Sept. 9, 1911	.....	5,500	.....	*18,875	2,491.50	13.20	Mississippi Riv.	Not completed.
2190-2254	East Carroll...	Sept. 9, 1911	.....	6,400	.....	*5,295	698.94	13.20	Mississippi Riv.	Not completed.
2254-2310	East Carroll...	Sept. 9, 1911	.....	5,446	.....	*69,865	9,222.19	13.20	Mississippi Riv.	Not completed.
2805-2860	East Carroll...	Aug. 6, 1910	Apr. 22, 1911	.....	5,500	53,029	8,325.55	15.70	Mississippi Riv.	
3070-3160	Madison	Aug. 15, 1910	Apr. 4, 1911	.....	9,000	90,101	17,434.54	19.35	Mississippi Riv.	
Total added in two years				22,571 or 4¼ miles.	27,730 or 5¼ miles.	454,868	$81,155.48	17.84	Average price.	

*Includes estimates for February

REVETMENT.

NAME OF LOCALITY.	Cairo.	Length of Revetment April 20, 1910.	Length Added During Period.	Total Length April 20, 1912.	Expenditures* April 20, 1910, to April 20, 1912.
		Feet.	Feet.	Feet.	
Panther Forest, Ark	452 R	2,000	2,150	4,150	$75,000.00
Leland Neck, Ark	471 R	3,150	2,057	5,200	94,000.00
Vaucluse, Ark	487 R	1,700	2,000	3,700	78,000.00
Grand Lake, Ark	509 R	None.	4,000	4,000	135,000.00
Louisiana Bend, La	522 R	11,300	.....	11,300	10,000.00
Lake Providence, La	540 R	12,600	.....	12,600	11,000.00
Delta Point, La	598 R	5,900	.....	5,900	30,000.00
Reid-Bedford, La	603 R	3,500	2,880	6,380	125,000.00
Totals	.....	40,150	13,087	53,230	$558,000.00

*Amounts shown are approximate and include maintenance of existing works and pro rata charges for care and repairs to plant for 1910-1911 only

The Board of State Engineers is indebted to the courtesy of Captain C. O. Sherrill, Corps of Engineers, U. S. A., for the following statement of levees built and enlarged by the United States in the Fourth District, improving Mississippi River from opposite Warrenton, Miss., to Head of Passes, Louisiana, from April 20, 1910, to April 20, 1912.

NAME OF CONTRACT.	Sections.	Miles below Cairo.	Date of Contract.	Date of final Certificate.	New Levee. Lin. Ft.	Enlargement. Lin. Ft.	Cubic Yards.	Cost.
LOWER TENSAS DISTRICT.								
Loyd	1–9	626–R	July 15, 1910	Nov. 13, 1910	.....	10,500	110,669.73	$19,588.54
Buckridge	1–9	627–5–R	July 15, 1910	Nov. 6, 1910	.....	10,500	83,141.06	12,803.73
Elk Ridge	1–9	629–R	July 15, 1910	Oct. 29, 1910	.....	10,221	134,143.94	25,554.41
Evergreen	1–9	632–4–R	Oct. 27, 1910	Mar. 6, 1911	.....	10,226	109,238.99	20,755.41
Harpers	1–3	654–R	Oct. 27, 1910	Mar. 30, 1911	.....	4.455	36,469.72	4,704.60
Kempe	1–8	657–R	Oct. 27, 1910	Oct. 28, 1911	.....	6,261	99,472.31	12,324.61
Melwood	1–10	660–R	Aug. 24, 1910	Nov. 24, 1911	.....	11,473	112,092.21	17,071.64
Myrtle Grove	1–10	662–2–R	Aug. 24, 1910	Oct. 30, 1911	.....	10,600	111,707.17	17,013.01
Waterproof	1–10	663–4–R	Aug. 24, 1910	Sept. 29, 1911	.....	10,700	115,497.21	17,590.25
Grassmere	1–4	691–R	Oct. 27, 1910	Feb. 16, 1912	.....	4,786	50,936.71	6,311.06
Palo Alto	.....	699–700–R	Oct. 10, 1911	.....	.....	.....	20,303.89	2,923.76
Arnauldia	.....	701–2–R	Oct. 10, 1911	.....	.....	.....	38,562.13	4,897.49
Greens, Lot 1	1–8	723–R	July 21, 1909	Aug. 31, 1910	1,400	.....	80,615.93	25,313.40
Greens, Lot 2	1–8	723–R	July 19, 1909	Aug. 20, 1910	1,900	.....	104,744.57	32,994.54
Greens, Lot 3	1–9	723–R	Sept. 15, 1909	June 29, 1910	1,800	.....	88,061.32	24,639.56
Bougere, Lot 20*	4	739–5–R	June 21, 1907	June 28, 1910	200	.....	4,210.14	757.83
Bougere, Lot 20x	4	739–5–R	June 21, 1907	June 28, 1910	200	.....	6,911.95	2,556.04
					5,500 or 1.4 miles.	89,718 or 17.0 miles.	1,306,779.78	$247,799.28

Palo Alto and Arnauldia Levees are partly completed. and cubic yards given in above table have been paid for.
*Cutting out slough in levee.
xFilling and refilling slough in levee.

ATCHAFALAYA.

Name of Contract.	Sections.	Miles below Cairo.	Date of Contract.	Date of final Certificate.	New Levee. Lin Feet.	Enlargement. Lin Feet.	Cubic Yards.	Cost.
Allendale, Lot 1		824–R	Sept. 2, 1910	Oct. 30, 1911	2,667	.....	141,428.98	$27,154.37
Allendale, Lot 2		824–R	Sept. 2, 1910	Jan. 19, 1912	2,435	.....	123,759.72	23,761.37
					5,098 or 0.97 miles.	.....	265,188.70	$50,915.74

LAFOURCHE LEVEE DISTRICT.

Lucy	1–3	930–R	Nov. 9, 1910	Dec. 30, 1910	1,537 or 0.29 miles.	.....	35,801.16	5,683.47

BARATARIA LEVEE DISTRICT.

Myrtle Grove		1004–R	Built by U. S. Levee Machine. do	Dec. 5, 1911	2,411	2,726	53,794.29	$5,517.99*
Junior		1009–R	do	Dec. 7, 1910	1,780	.....	22,450.00	2,224.36*
Metcalf		1028–R	do	May 18, 1911	.....	1,875	10,413.77	1,069.22*x
Reddick		1038–R	do	July 8, 1911	2,464	.....	23,226.84	2,194.93*
Fort Jackson		1038–40–R	do	Sept. 7, 1911	1,183	9,735	43,336.00	5,949.39*
					7,838 or 1.48 miles.	14,336 or 2.71 miles.	153,220.90	$16,955.89

*Includes fixed charges for interest for investment and for deterioration of plant.
xDoes not include cost of dressing and siding paid for by Buras Levee Board at $7.40 per station of 100 feet.

LEVEE REVETMENT.

Name of Levee.	Sections.	Miles below Cairo.	Kind of Revetment.	Completed.	Linear Feet.	Cost.	
Myrtle Grove		1004–R	Concrete	Feb. 24, 1912	5,137	$16,494.24	
Junior		1009–R	Wooden	Mar. 7, 1911	1,780	1,438.78	
					6,917 or 1.31 miles.	$17,933.02	

PONTCHARTRAIN LEVEE DISTRICT.

Name of Contract.	Sections.	Miles below Cairo.	Date of Contract.	Date of final Certificate.	New Levee, Lin Feet.	Enlargement. Lin Feet.	Cubic Yards.	Cost.
Gem	1–10	882–L	Nov. 12, 1909	June 9, 1910	3,129	.....	130,539.90	$22,178.74
Bonnett Carre	1–8	928–L	Sept. 23, 1910	Mar. 20, 1911	.....	12,080	90,151.82	16,137.17
Fairview	1–9	950–L	Sept. 23, 1910	Feb. 23, 1911	2,785	3,487	107,139.19	14,678.07
Boisblanc	1–4	950–L	Dec. 27, 1909	July 31, 1910	2,173	.....	54,476.42	8,117.00
					8,087 or 1.53 miles.	15,567 or 2.95 miles.	382,307.33	$61,110.98

LAKE BORGNE LEVEE DISTRICT.

Corinne		972–L	Built by U. S. Levee Machine.	In progress—to be completed early in April.	.....	9,300	47,128.32*	.....
Belair		999–L	do	Nov. 7, 1910....	4,605	.....	102,858.11	$10,243.23
Burbridge		1002–L	Sept. 2, 1910....	Dec. 23, 1910....	1,777	.....	28,317.68	4,811.17
Lower Point Pleasant		1032–L	Built by U. S. Levee Machine.	April 23, 1910....	.....	8,943	38,609.43	39,875.81
					6,382 or 1.21 miles.	18,243 or 3.45 miles.	216,913.65	$54,930.21

*Approximate.

REVETMENTS.

Name of Revetment.	Parish.	Total Length Constructed During Period		Expended During Period.		Total.
		Proposed Feet.	Constructed Feet.	For New Revetment.	For Repairs.	
Kempe Bend	Tensas	11,265	11,265	$337,546.96	$1,603.07	
Giles Bend	Adams Co.	0	0	*116,916.44	107,878.09	
Natchez Front	Adams Co.	594	594	17,111.26	2,244.94	
Plaquemines	Iberville	1,000	1,215	45,636.67	0	
New Orleans Harbor	Orleans	17,815	17,815	356,397.93	0	
Grand Total	.....	40,674	40,889 or 7.74 miles.	$873,609.26	$111,726.10	$985,335.36

*This amount was used in completing the work of previous years by grading and paving upper bank.

UNITED STATES.

APPENDIX A. UNITED STATES CONTRACTS.

Recapitulation of work done from April 20, 1910, to April 20, 1912, as shown by the foregoing.

DISTRICT.	Miles of New Levee.	Miles of Enlargement.	Cubic Yards.	Cost.
Upper Tensas in Arkansas	0.70	4.92	390.007	$117,963.10
Upper Tensas in La... Fifth Louisiana	4.25	5.25	454,868	81,155.48
Lower Tensas..... Levee Dist.	1.04	17.00	1,306,781	247,799.28
Atchafalaya Basin	0.97	.....	265,190	50,915.74
Pontchartrain	1.53	2.95	382,308	61,110.98
Lafourche	1.08	0.52	112,046	13,425.82
Lake Borgne	1.21	1.76	178,304	15,054.40
Grand Prairie	.....	1.69	38,609	39,875.81
Buras	0.69	2.20	76,977	9,213.54
Totals	11.47	36.29	3,205,090	$636,514.15

APPENDIX A STATEMENT NO. 20. SUMMARY ACCORDING TO DISTRICTS.

Approximate quantities and cost of levee work in the several Levee Districts of Louisiana, and in Desha and Chicot Counties, Arkansas, from April 20, 1910, to April 20, 1912, by the Districts, State and United States, as shown in the foregoing Statements.

NAME OF LEVEE DISTRICT.	BY WHOM DONE.	MILES OF DISTRICT.			
		New Levee	Enlargement.	Cubic Yards.	Cost.
In Arkansas	Tensas Basin Levee District	1.44	5.78	758,554	$181,086.05
	United States	0.70	4.92	390,007	117,963.10
Totals		2.14	10.70	1,148,561	$299,049.15
In Louisiana	Tensas Basin Levee District	0.14	.....	12,545	$2,877.80
Fifth Louisiana Levee District	District	2.89	16.89	1,393,362	$239,774.73
	State	3.52	10.17	877,248	219,839.07
	United States	5.29	22.25	1,761,648	328,954.76
Totals		11.70	49.31	4,032,258	$788,568.56
Atchafalaya Basin Levee District	District	6.09	6.17	1,214,432	$294,057.08
	State	1.84	1.08	339,411	58,801.00
	United States	0.97	.....	265,189	50,915.74
Totals		8.90	7.25	1,819,032	$403,773.82
Pontchartrain Levee District	District	0.31	0.51	93,094	$16,146.79
	State	0.56	3.60	287,234	47,012.68
	United States	1.53	2.95	382,307	61,110.98
Totals		2.40	7.06	762,635	$124,270.45

NAME OF LEVEE DISTRICT.	BY WHOM DONE.	MILES OF DISTRICT.			
		New Levee	Enlargement.	Cubic Yards.	Cost.
Lafourche Levee District	District	0.20	0.98	24,341	$5,076.31
	State	1.56	2.46	264,358	48,651.10
	United States	1.08	0.52	112,045	13,425.82
Totals		2.84	3.96	400,744	$67,153.23
Orleans Levee District	District	0.61	10.62	503,776	$220,875.43
Lake Borgne Basin Levee District	District	0.54	1.63	54,115	$10,530.65
	State	1.51	.....	130,139	25,307.89
	United States	1.21	1.76	178,304	15,054.40
Totals		3.26	3.39	362,558	$50,892.94
Grand Prairie Levee District	State	0.75	1.96	86,836	$30,203.91
	United States	.....	1.69	38,609	39,875.81
Totals		0.75	3.65	125,445	$70,079.72
Buras Levee District	State	1.57	0.46	52,986	$24,957.02
	United States	0.69	2.20	76,977	9,213.54
Totals		2.26	2.66	129,963	$34,170.56
Plaquemines Parish East Bank Levee District	District	5.29	1.37	190,936	$25,065.92
	State	0.06	22.30	201,203	40,258.64
Totals		5.35	23.67	392,139	$65,324.56

Caddo Levee District	District	5.25	2.11	410,173	$58,026.69
Bossier Levee District	State	0.71	.....	49,364	$6,165.56
Bossier Sub-Levee District	State	0.38	0.51	72,109	$9,302.06
Red River Parish Sub-Levee District	State	0.87	.....	35,581	$8,005.72
Red River, Atchafalaya and Bayou Boeuf Levee District	District	1.97	.....	208,344	$45,597.88
	State	8.99	2.47	402,850	80,897.37
Totals		10.96	2.47	611,194	$126,495.25
Natchitoches Sub-Levee District	State	0.56	.....	12,521	$1,502.52
Red River and Bayou des Glaizes Levee and Drainage District	District	4.00	.....	336,208	$84,052.00
Saline Levee and Drainage District	State	3.50	.....	80,285	$11,632.06
		DRAINAGE.			
		Excavation.	Clearing.		
Red River, Atchafalaya and Bayou Boeuf Levee District	District	1.51	2.63	37,839	$10,159.84
		IMPROVEMENT OF BAYOU LAFOURCHE.			
Atchafalaya Basin and Lafourche Levee Districts	Districts	2.01	.....	145,724	$22,858.60

RECAPITULATION.

NAME OF LEVEE DISTRICT.	MILES OF		Cubic Yards.	Cost.
	New Levee	Enlargement.		
In Arkansas: Tensas Basin Levee District	2.14	10.70	1,148,561	$299,049.15
In Louisiana: Tensas Basin Levee District	0.14	.....	12,545	2,877.80
Fifth Louisiana Levee District	11.70	49.31	4,032,258	788,568.56
Atchafalaya Basin Levee District	8.90	7.25	1,819,032	403,773,82
Pontchartrain Levee District	2.40	7.06	762,635	124,270.45
Lafourche Levee District	2.84	3.96	400,744	67,153.23
Orleans Levee District	0.61	10.62	503,776	220,875.43
Lake Borgne Basin Levee District	3.26	3.39	362,558	50,892.94
Grand Prairie Levee District	0.75	3.65	125,445	70,079.72
Buras Levee District	2.26	2.66	129,963	34,170.56
Plaquemines Parish East Bank Levee District	5.35	23.67	392,139	65,324.56
Caddo Levee District	5.25	2.11	410,173	58,026.69
Bossier Levee District	0.71	.....	49,364	6,165.56
Bossier Sub-Levee District	0.38	0.51	72,109	9,302.06
Red River Parish Sub-Levee District	0.87	.....	35,581	8,005.72
Red River, Atchafalaya and Bayou Boeuf Levee District	10.96	2.47	611,194	126,495.25
Natchitoches Sub-Levee District	0.56	.....	12,521	1,502.52
Red River and Bayou des Glaizes Levee and Drainage District	4.00	.....	336,208	84,052.00
Saline Levee and Drainage District	3.50	.....	80,285	11,632.06
Totals	66.58	127.36	11,297,091	$2,432,218.08

STATEMENT NO. 21. SUMMARY ACCORDING TO STREAMS.

Approximate quantities and cost of levee work in the several Levee Districts of Louisiana, and Desha and Chicot Counties, Arkansas, from April 20, 1910, to April 20, 1912, by the Districts, State and United States, as shown in the foregoing Statements.

STREAM.	LEVEE DISTRICT.	By Whom Done.	MILES OF New Levee.	MILES OF Enlargement.	Cubic Yards.	Cost.
IN ARKANSAS.						
Arkansas River	Tensas Basin	United States	0.70	.....	273,572	$92,905.54
Mississippi River	Tensas Basin	District	1.44	5.78	758,554	$181,086.05
		United States	.....	4.92	116,435	25,057.56
	Totals		1.44	10.70	874,989	$206,143.61
IN LOUISIANA.						
Mississippi River	Fifth Louisiana	District	2.89	16.89	1,393,362	$239,774.73
		State	3.52	10.17	877,248	219,839.07
		United States	5.29	22.25	1,761,648	328,954.76
	Totals		11.70	49.31	4,032,258	$788,568.56
	Atchafalaya Basin	District	4.12	0.84	692,548	$115,681.59
		State	1.78	1.08	327,671	56,301.00
		United States	0.97	.....	265,189	50,915.74
	Totals		1.87	1.92	1,285,408	222,898.33
	Pontchartrain	District	0.31	0.51	93,094	$16,146.79
		State	0.56	3.60	287,234	47,012.68
		United States	1.53	2.95	382,307	61,110.98
	Totals		2.40	7.06	762,635	$124,270.45
	Lafourche	District	0.20	0.98	24,341	$5,076.31
		State	1.56	2.46	264,358	48,651.10
		United States	1.08	0.52	112,045	18,425.82
	Totals		2.84	3.96	400,744	$67,153.23

STREAM.	DISTRICT.	By Whom Done.	MILES OF New Levee.	MILES OF Enlargement.	Cubic Yards.	Cost.
Mississippi River—Cont'd	Orleans	DISTRICT	0.61	4.62	478,558	$207,180.30
	Lake Borgne Basin	District	0.54	1.63	54,115	$10,530.65
		State	1.51	.....	130,139	25,307.89
		United States	1.21	1.76	178,304	15,054.40
	Totals		3.26	3.39	362,558	$50,892.94
	Grand Prairie	State	0.75	1.96	86,836	$30,203.91
		United States	.....	1.69	38,609	39,875.81
	Totals		0.75	3.65	125,445	$70,079.72
	Buras	State	1.57	0.46	52,986	$24,957.02
		United States	0.69	2.20	76,977	9,213.54
	Totals		2.26	2.66	129,963	$34,170.56
Atchafalaya River	Atchafalaya Basin	District	1.97	5.33	521,884	$178,375.49
		State	0.06	.....	11,740	2,500.00
	Totals		2.03	5.33	533,624	$180,875.49
	Red River, Atchafalaya and Bayou Boeuf	District	1.97	.....	208,344	$45,597.88
		State	1.71	2.47	254,306	59,682.44
	Totals		3.68	2.47	462,650	$105,280.32

Red River	Caddo	District	5.25	2.11	410,173	$58,026.69
	Bossier	State	0.71	.....	49,364	$6,165.56
	Bossier Sub	State	0.38	0.51	72,109	$9,302.26
	Red River, Atchafalaya and Bayou Boeuf	State	0.47	.....	12,658	$1,737.94
	Natchitoches Sub	State	0.56	.....	12,521	$1,502.52
	Red River and Bayou des Glaizes	District	4.00	.....	336,208	$84,052.00
	Saline	State	3.50	.....	80,285	$11,632.06
Bayou Rapides	Red River, Atchafalaya and Bayou Boeuf	State	6.81	.....	135,886	$19,476.99
Loggy Bayou	Red River Parish Sub	State	0.87	.....	35,581	$8,005.72
Boeuf River	Tensas Basin	District	0.14	.....	12,545	$2,877.80
Gulf Coast	Plaquemines Parish East Bank	District	5.29	1.37	190,936	$25,065.92
		State	0.06	22.30	201,203	40,258.64
	Totals		5.35	23.67	382,139	$65,324.56
Interior Levees	Orleans	District	.....	6.00	25,218	$13,695.13

STREAM.	MILES OF		Cubic Yards.	Cost.
	New Levee.	Enlargement.		
Arkansas River in Arkansas	0.70	.....	273,572	$92,905.54
Mississippi River in Arkansas	1.44	10.70	874,989	206,143.61
Mississippi River in Louisiana	30.69	76.57	7,577,569	1,565,214.09
Atchafalaya River	5.71	7.80	996,274	286,155.81
Red River	14.87	2.62	973,318	172,418.83
Bayou Rapides	6.81	.....	135,886	19,476.99
Loggy Bayou	0.87	.....	35,581	8,005.72
Boeuf River	0.14	.....	12,545	2,877.80
Gulf Coast	5.35	23.67	392,139	65,324.56
Interior Levees	.....	6.00	25,218	13,695.13
Totals	66.58	127.36	11,297,091	$2,432,218.08

STATEMENT NO. 22.

SUMMARY.

GRAND TOTAL.

LEVEE WORK.	MILES OF New Levee.	MILES OF Enlargement.	Cubic Yards.	Cost.	Total Cost.
District	28.73	46.06	5,199,876	$1,183,167.33	
State	26.38	45.01	2,892,125	612,536.60	
United States	11.47	36.29	3,205,090	636,514.15	
Totals	66.58	127.36	11,297,091	$2,432,218.08	$2,432,218.08
DRAINAGE.	Miles Excavation.	Miles of Clearing.			
District	1.51	2.63	37,839	10,159.84	10,159.84
IMPROVMENT OF BAYOU LAFOURCHE.					
Districts	2.01	.....	145,724	22,858.60	22,858.60
REVETMENT FOR BANK PROTECTION.	Miles.				
United States.. Third District, Improving Mississippi River	2.48	.....	.....	558,000.00	
United States.. Fourth District, Improving Mississippi River	7.74	.....	.....	985,335.36	
Totals	10.22	.....	.....	$1,543,335.36	1,543,335.36
Total	.....	.....	.....	.....	$4,008,571.88

APPENDIX B.

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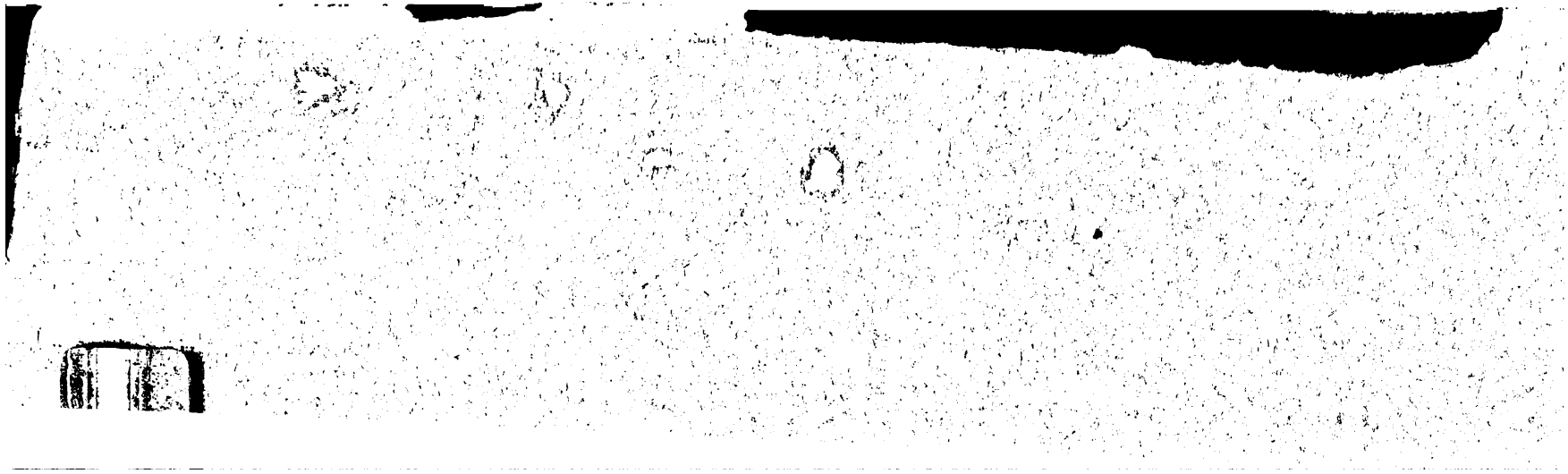
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